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Committee

10-17-2012

## Undergraduate Curriculum and Academic Policy Committee Minutes, October 17, 2012

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## Undergraduate Curriculum and Academic Policy Committee <br> Draft Minutes of Meeting <br> October 17, 2012

## Present:

Matt Rizki (CECS), Bev Schieltz (CoSM), Sherrill Smith (CoNH), Richard Mercer (CoSM), Sarah Twill (CoLA), Sean Pollack (CoLA), Stephanie Davis (CEHS), Joe Law (WAC/GE, Non-voting, Ex Officio), Jennifer Barbadora (Student Government, Non-voting), Matt Harman (Student Government, Non-voting)

## Guests:

Marian Brainerd (Registrar), Mary Holland (Assoc. Registrar), Todd Brittingham (Assoc. Registrar), Travis Doom (CECS)

1) The committee approved the minutes of the September 19, 2012 meeting
2) Course and Program Inventory Requests
a) UCAPC reviewed the following course inventory requests:

The committee approved the following requests as submitted:
APS 3040, ATH 2100, BME 3211, BME 4410, BME 4400, CHM 4680, CS 1181, CS 2210, CS 2100, EES 4270, ME 4080, ME 4430, PHY 4400, PLS 4440, STT 4310, TH 3990

The committee modified these courses after consulting with a representative of the originating department and then approved all the requests:

ATH 2110, ED 2100, ME 4340, ME 4740, ME 4850, NUR 4990, SW 4870
b) UCAPC reviewed the following program inventory requests:

Program modifications:
BS Computer Engineering (BSCE) - tabled at the request of the CoSM representative
BA Biology (Life Science Education) - approved
BS Chemistry (dual major) - approved (number of elective hours adjusted bring the program to 120 hours)
New programs:

Philosophy minor - approved with a correction to wording of required math and science courses.
Social Science Education Honors Program - approved
Modern Languages Honors Program - approved
Program Deactivations:

The Department of Computer Science and Engineering requested deactivation of the semester program concentrations listed below (summary list) - approved.

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CS - Computer Science - BSCS / Bioinformatics
CS - Computer Science - BSCS / Computational Science
CS - Computer Science - BACS / Music
CS - Computer Science - BACS / Business
CS - Computer Science - BSCS / Visualization
CS - Computer Science - BSCS / Earth &amp; Environmental Sciences
CS - Computer Science - BSCS / Business
CS - Computer Science - BS IECS / Earth &amp; Environmental Sciences
CS - Computer Science - BS IECS / Computational Science
CS - Computer Science - BS IECS / Bioinformatics
CEG - Computer Engineering - IECS / Wireless
CEG - Computer Science - BSCS / Visualization
CEG - Computer Engineering - BSCE / Wireless
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3) UCAPC recommended approval of Department of Information Systems and Operations Management request to change their department's name to the Department of Information Systems and Supply Chain Management (attachment).
4) The committee reviewed proposed modifications to the curriculum workflow to allow departments to request program deactivations or terminations. Once the modifications are complete, UCAPC has asked the Registrar's Office to ask departments with programs, minors and certificates that were not converted from quarter to semesters to initiate requests through the workflow to (1) convert the programs from quarters-to-semesters, (2) deactivate the programs or (3) terminate the programs (attachment).
5) In the September 19, 2012 meeting UCAPC discussed how to resolve a software problem in BANNER that was preventing the Department of Kinesiology and Health from offering the same KNH courses in A and B terms during a single semester. The committee approved a plan to create a duplicate set of courses by changing the final digit of a series of KHN courses from 0 to 1 to distinguish between A and B term. The Registrar Office suggested that adding an A or B to the end of the course numbers would provide a better solution. The committee approved of this approach to resolving the problem and asked the Registrar's Office to work with Department of Kinesiology and Health to implement this solution before the start of registration for Spring 2013 ( $\underline{\text { A/B courses }) . ~}$
6) The committee reviewed forms designed to assess student outcomes in core courses (Gen. Ed., IW etc.). Several problems were noted with the forms. Dr. Joe Law agreed to circulate the forms to the colleges so faculty involved in teaching core course can review them and provide feedback (attachment).
7) The Chair of UCAPC provided an update on discussions with Ellucian focused on identifying a mechanism to adapt the BANNER system to allow selective prerequisite checking (attachment).
8) The Chair of UCAPC reported on the progress of Dr. Herb Dragella's efforts to design a survey to collect feedback on the curriculum workflow. The goal is to use this feedback to develop user requirements to guide the implementation of the next generation curriculum workflow.
9) UCAPC briefly discussed the College Readiness Standards and also the Senate's charge to UCAPC related to the Report on Student Success. A decision was made to hold a special meeting on Wednesday, November 7, 2012 at 3:00 in 399 Joshi to have a extend discussion on these topics. The Chair of UCAPC agreed to invite the chairs of senate's ad hoc committees on student success to this meeting.
10) Adjourned

## Course Inventory Process Tracking - Detail

*** Click on the WorkFlow button below to go to the Work Flow application

| FORM | COURSE INFORMATION |
| :---: | :---: |
| 9251 <br> STATUS: Process CREATOR: Bonnie Mathies CREATED: 6/18/12 IN-PROCESS: 10/3/12 WorkFlow | VERSION: CURR <br> COURSE: APS3040 - Applied Studies Management <br> STUDENT REC TITLE: APS Management <br> EFFECTIVE: Fall 2012 <br> COURSE DESC: A course to provide opportunities for students to gain knowledge, practice, and study in technical management. Focus on management fundamentals such as organizational structure, planning, control, change, etc. as they apply to business and organizational settings. <br> COLLEGE: Wright State Lake Campus <br> CRED HR: 3 <br> VAR CRED RANGE: - <br> GRADE SYS: <br> LEVEL: Undergraduate <br> COURSE TYPE: Lecture |
|  | VERSION: REV <br> COURSE: APS3040 - Applied Studies Management <br> STUDENT REC TITLE: APS Management <br> EFFECTIVE: Fall 2012 <br> COURSE DESC: A course to provide opportunities for students to gain knowledge, practice, and study in technical management. Focus on management fundamentals such as organizational structure, planning, control, change, etc. as they apply to business and organizational settings. Integrated Writing Course <br> COLLEGE: Wright State Lake Campus |

## Course Inventory Process Tracking - Detail

*** Click on the WorkFlow button below to go to the Work Flow application

| FORM | COURSE INFORMATION |
| :---: | :---: |
| 9679 <br> STATUS: Process CREATOR: Geoffrey Owens CREATED: 10/1/12 IN-PROCESS: 10/4/12 WorkFlow | VERSION: CURR <br> COURSE: ATH2100 - Introduction to Biological Anthropology <br> STUDENT REC TITLE: Intro to Bio Anth <br> EFFECTIVE: Fall 2012 <br> COURSE DESC: An overview of human biology and behavior, including human evolution, primate behavior, and human physical variation. <br> COLLEGE: College of Liberal Arts <br> QTR EQUIV: ATH 241 |
|  | VERSION: REV <br> COURSE: ATH2100 - Introduction to Biological Anthropology <br> STUDENT REC TITLE: Intro to Bio Anth <br> EFFECTIVE: Fall 2012 <br> COURSE DESC: An overview of human biology and behavior, including human evolution, primate behavior, and human physical variation. <br> COLLEGE: College of Liberal Arts <br> CRED HR: 3 VAR CRED RANGE: 0-0 <br> GRADE SYS: S LEVEL: Undergraduate COURSE TYPE: Lecture <br> REP HRS: 0 <br> REP TIMES: 0 <br> COREQ: ATH 2110 <br> QTR EQUIV: ATH 241 |

## Course Inventory Process Tracking - Detail

*** Click on the WorkFlow button below to go to the Work Flow application

| FORM | COURSE INFORMATION |
| :---: | :---: |
| 9680 <br> STATUS: Process CREATOR: Geoffrey Owens CREATED: 10/1/12 IN-PROCESS: 10/8/12 WorkFlow | VERSION: REV <br> COURSE: ATH2110 - Lab in Biological Anthropology <br> STUDENT REC TITLE: Lab in Biological Anthro <br> EFFECTIVE: Fall 2012 <br> COURSE DESC: Laboratory exercises to accompany ATH 2100, Introduction to Biological <br> Anthropology. Co-enrollment in ATH 2100 required. <br> COLLEGE: College of Liberal Arts |

## Course Inventory Process Tracking - Detail

*** Click on the WorkFlow button below to go to the Work Flow application

| FORM | COURSE INFORMATION |
| :---: | :---: |
| 9546 <br> STATUS: Process CREATOR: Jennifer Weaver CREATED: 9/11/12 <br> IN-PROCESS: 9/26/12 <br> WorkFlow | VERSION: CURR <br> COURSE: BME3211 - Human Biomechanics I <br> STUDENT REC TITLE: Human Biomechanics I <br> EFFECTIVE: Fall 2012 <br> COURSE DESC: Biostatic considerations, human systems and mechanics. <br> COLLEGE: College of Egr \& Computer Sci <br> CRED HR: 4 <br> VAR CRED RANGE: - <br> GRADE SYS: <br> LEVEL: Undergraduate <br> COURSE TYPE: Lecture/Recitation <br> Combination <br> QTR EQUIV: BME 428 |
|  | VERSION: REV <br> COURSE: BME3211 - Human Biomechanics I <br> STUDENT REC TITLE: Human Biomechanics I <br> EFFECTIVE: Fall 2012 <br> COURSE DESC: Biostatic considerations, human systems and mechanics. <br> COLLEGE: College of Egr \& Computer Sci <br> CRED HR: 4 VAR CRED RANGE: 0-0 <br> GRADE SYS: $S$ LEVEL: Undergraduate <br> COURSE TYPE: Lecture/Recitation <br> Combination <br> REP HRS: 0 <br> REP TIMES: 0 <br> SEM PREREQ: (EGR 1010 or MTH 2300) and PHY 2400 <br> QTR EQUIV: BME 428 |

## Course Inventory Process Tracking - Detail

*** Click on the WorkFlow button below to go to the Work Flow application

| FORM | COURSE INFORMATION |
| :---: | :---: |
| 9547 <br> STATUS: Process CREATOR: Jennifer Weaver CREATED: 9/11/12 IN-PROCESS: 9/26/12 WorkFlow | VERSION: CURR <br> COURSE: BME4410 - Biothermodynamics <br> STUDENT REC TITLE: Biothermodynamics <br> EFFECTIVE: Fall 2012 <br> COURSE DESC: Application of first and second laws of thermodynamics to human, physiological and biological systems. <br> COLLEGE: College of Egr \& Computer Sci <br> CRED HR: 3 <br> VAR CRED RANGE: - <br> GRADE SYS: <br> LEVEL: Undergraduate <br> COURSE TYPE: Lecture <br> QTR EQUIV: BME 419 |
|  | VERSION: REV <br> COURSE: BME4410 - Biothermodynamics <br> STUDENT REC TITLE: Biothermodynamics <br> EFFECTIVE: Fall 2012 <br> COURSE DESC: Application of first and second laws of thermodynamics to human, physiological and biological systems. <br> COLLEGE: College of Egr \& Computer Sci <br> CRED HR: 3 VAR CRED RANGE: 0-0 <br> GRADE SYS: S LEVEL: Undergraduate COURSE TYPE: Lecture <br> REP HRS: 0 <br> REP TIMES: 0 <br> SEM PREREQ: (EGR 1010 or MTH 2300) and PHY 2400 <br> XLIST: BME 6410 <br> QTR EQUIV: BME 419 |

## Course Inventory Process Tracking - Detail

*** Click on the WorkFlow button below to go to the Work Flow application

| FORM | COURSE INFORMATION |
| :---: | :---: |
| 9544 <br> STATUS: Process CREATOR: Jennifer Weaver CREATED: 9/11/12 <br> IN-PROCESS: 9/26/12 <br> WorkFlow | VERSION: CURR <br> COURSE: BME4440 - Biomaterials <br> STUDENT REC TITLE: Biomaterials <br> EFFECTIVE: Fall 2012 <br> COURSE DESC: Application of materials in different biomedical fields. Design and analyses. <br> COLLEGE: College of Egr \& Computer Sci <br> CRED HR: 4 <br> VAR CRED RANGE: - <br> GRADE SYS: LEVEL: Undergraduate COURSE TYPE: Lecture/Lab <br>  <br> Computer Sci <br> QTR EQUIV: BME 440 |
|  | VERSION: REV <br> COURSE: BME4440 - Biomaterials <br> STUDENT REC TITLE: Biomaterials <br> EFFECTIVE: Fall 2012 <br> COURSE DESC: Application of materials in different biomedical fields. Design and analyses. <br> COLLEGE: College of Egr \& Computer Sci <br> CRED HR: 4 VAR CRED RANGE: 0-0 <br> GRADE SYS: S LEVEL: Undergraduate COURSE TYPE: Lab, Lecture <br> REP HRS: 0 REP TIMES: 0 <br>  <br> Computer Sci <br> SEM PREREQ: ( BME 3212 and BME 3540 ) <br> XLIST: BME 6440 <br> QTR EQUIV: BME 440 |

WRIGHT STATE UNIVERSITY
*** Click on the WorkFlow button below to go to the Work Flow application

| FORM | COURSE INFORMATION |
| :---: | :---: |
| 9159 <br> STATUS: Process CREATOR: David Grossie <br> CREATED: 5/30/12 <br> IN-PROCESS: 10/8/12 <br> WorkFlow | VERSION: CURR <br> COURSE: CHM4680 - Experimental Nanomaterials and Nanoscience <br> STUDENT REC TITLE: Experimental Nanoscience <br> EFFECTIVE: Fall 2012 <br> COURSE DESC: Laboratory experiments include fabrication of nanomaterials such as metal nanoparticles and graphene nanoplatelets; characterization of physical and chemical properties by using techniques such as Raman spectroscopy, atomic force microscopy, terahertz spectroscopy, electrochemical analyses and computational modeling of nanoscale physical phenomena. <br> COLLEGE: College of Science \& Math <br> CRED HR: 3 <br> VAR CRED RANGE: - <br> GRADE SYS: <br> LEVEL: Undergraduate <br> COURSE TYPE: Lab |
|  | VERSION: REV <br> COURSE: CHM4680 - Experimental Nanomaterials and Nanoscience <br> STUDENT REC TITLE: Experimental Nanoscience <br> EFFECTIVE: Fall 2012 <br> COURSE DESC: Laboratory experiments include fabrication of nanomaterials such as metal nanoparticles and graphene nanoplatelets; characterization of physical and chemical properties by using techniques such as Raman spectroscopy, atomic force microscopy, terahertz spectroscopy, electrochemical analyses and computational modeling of nanoscale physical phenomena. <br> COLLEGE: College of Science \& Math <br> CRED HR: 3 VAR CRED RANGE: 0-0 <br> GRADE SYS: S LEVEL: Undergraduate COURSE TYPE: Lab, Lecture <br> REP HRS: 0 REP TIMES: 0 <br> SEM PREREQ: CHM 1210 and CHM 1210L and ((PHY 1120 and PHY 1120 L) or (PHY 2410 and PHY2410L)) <br> XLIST: CHM 6680, ME 6680, ME 4680 |

*** Click on the WorkFlow button below to go to the Work Flow application

| FORM | COURSE INFORMATION |
| :---: | :---: |
| 9275 <br> STATUS: Process CREATOR: Wendy Chetcuti CREATED: 6/21/12 IN-PROCESS: 9/27/12 WorkFlow | VERSION: CURR <br> COURSE: CS1181 - Computer Science II <br> STUDENT REC TITLE: Computer Science II <br> EFFECTIVE: Fall 2012 <br> COURSE DESC: Advanced concepts of computer programming. Use of data structures and tools that facilitate programming. Integrated Writing course. <br> COLLEGE: College of Egr \& Computer Sci <br> CRED HR: 4 <br> VAR CRED RANGE: - <br> GRADE SYS: <br> LEVEL: Undergraduate <br> COURSE TYPE: Lecture <br> QTR PREREQ: (CS 241 and MTH 257) or CEG 221 |
|  | VERSION: REV <br> COURSE: CS1181 - Computer Science II <br> STUDENT REC TITLE: Computer Science II <br> EFFECTIVE: Fall 2012 <br> COURSE DESC: Advanced concepts of computer programming. Use of data structures and tools that facilitate programming. Integrated Writing course. <br> COLLEGE: College of Egr \& Computer Sci <br> CRED HR: $4 \quad$ VAR CRED RANGE: 0-0 WRIT INT: $Y$ <br> GRADE SYS: S LEVEL: Undergraduate COURSE TYPE: Lab, Lecture <br> REP HRS: 0 REP TIMES: 0 <br> SEM PREREQ: (C or higher in CS 1180 or CS 1161) and (MTH 1280 OR MTH 1340 OR WSU <br> Math Level MPL 05) <br> QTR PREREQ: (CS 241 and MTH 257 ) or CEG 221 |

## Course Inventory Process Tracking - Detail

*** Click on the WorkFlow button below to go to the Work Flow application

| FORM | COURSE INFORMATION |
| :---: | :---: |
| 9466 <br> STATUS: Process CREATOR: Wendy Chetcuti CREATED: 8/13/12 <br> IN-PROCESS: 9/26/12 <br> WorkFlow | VERSION: CURR <br> COURSE: CS2210 - Logic for Computer Scientists <br> STUDENT REC TITLE: Logic for Comp Scientist <br> EFFECTIVE: Fall 2012 <br> COURSE DESC: Fundamental material in foundations of logic most relevant to Computer <br> Science. Propositional logic, predicate logic, modeling of knowledge, and algorithms for logical reasoning. <br> COLLEGE: College of Egr \& Computer Sci <br> CRED HR: 3 <br> VAR CRED RANGE: - <br> GRADE SYS: <br> LEVEL: Undergraduate <br> COURSE TYPE: Lecture |
|  | VERSION: REV <br> COURSE: CS2210 - Logic for Computer Scientists <br> STUDENT REC TITLE: Logic for Comp Scientist <br> EFFECTIVE: Fall 2012 <br> COURSE DESC: Fundamental material in foundations of logic most relevant to Computer <br> Science. Propositional logic, predicate logic, modeling of knowledge, and algorithms for logical reasoning. <br> COLLEGE: College of Egr \& Computer Sci <br> CRED HR: 3 VAR CRED RANGE: 0-0 <br> GRADE SYS: S LEVEL: Undergraduate COURSE TYPE: Lecture <br> REP HRS: 0 REP TIMES: 0 <br> SEM PREREQ: MTH 2570 or CS 2200 |

## Course Inventory Process Tracking - Detail

*** Click on the WorkFlow button below to go to the Work Flow application

| FORM | COURSE INFORMATION |
| :---: | :---: |
| 8853 <br> STATUS: Process CREATOR: Melissa Rubins CREATED: 4/26/12 IN-PROCESS: 9/24/12 WorkFlow | VERSION: CURR <br> COURSE: ED210 - Education in a Democracy <br> STUDENT REC TITLE: Education in a Democracy <br> EFFECTIVE: Summer 2012 <br> COURSE DESC: This course explores the role and relationship of education in a democracy to concepts of civil society, social justice, access to knowledge, and development of democratic character in the young. <br> COLLEGE: College of Ed \& Human Services |
|  | VERSION: REV <br> COURSE: ED2100 - Education in a Democracy <br> STUDENT REC TITLE: Education in a Democracy <br> EFFECTIVE: Fall 2012 <br> COURSE DESC: Explores role of education in a democracy to concepts of social justice, diversity and privilege, historical and current oppression, equitable access to knowledge, and development of respect between/among individuals and groups in a global society. COLLEGE: College of Ed \& Human Services <br> QTR EQUIV: ED 210 |

*** Click on the WorkFlow button below to go to the Work Flow application

| FORM | COURSE INFORMATION |
| :---: | :---: |
| 7352 <br> STATUS: Process CREATOR: David Dominic CREATED: 2/7/11 IN-PROCESS: 9/28/12 WorkFlow | VERSION: CURR <br> COURSE: EES427 - Process Geomorphology <br> STUDENT REC TITLE: Process Geomorphology <br> EFFECTIVE: Spring 2011 <br> COURSE DESC: Study of the processes that create and modify landforms. Classifications of landforms and what they reveal of past geologic processes and climates. <br> COLLEGE: College of Science \& Math <br> CRED HR: 4 <br> VAR CRED RANGE: - <br> GRADE SYS: <br> LEVEL: Undergraduate <br> COURSE TYPE: Lecture <br> QTR PREREQ: EES 253 and EES 254 <br> QTR EQUIV: EES 427 |
|  | VERSION: REV <br> COURSE: EES4270 - Process Geomorphology <br> STUDENT REC TITLE: Process Geomorphology <br> EFFECTIVE: Spring 2013 <br> COURSE DESC: Study of the processes that create and modify landforms. Classifications of landforms and what they reveal of past geologic processes and climates. <br> COLLEGE: College of Science \& Math <br> CRED HR: 3 VAR CRED RANGE: 0-0 <br> GRADE SYS: S LEVEL: Undergraduate COURSE TYPE: Lecture <br> REP HRS: 0 <br> REP TIMES: 0 <br> SEM PREREQ: EES 2510 <br> XLIST: EES 6270 <br> QTR PREREQ: EES 253 and EES 254 <br> QTR EQUIV: EES 427 |

*** Click on the WorkFlow button below to go to the Work Flow application

| FORM | COURSE INFORMATION |
| :---: | :---: |
| 9502 <br> STATUS: Process CREATOR: Angela Griffith CREATED: 8/27/12 IN-PROCESS: 10/8/12 WorkFlow | VERSION: CURR <br> COURSE: ME4080 - Design Optimization <br> STUDENT REC TITLE: Design Optimization <br> EFFECTIVE: Fall 2012 <br> COURSE DESC: Concepts of minima and maxima; linear, dynamic, integer, and nonlinear programming; variational methods. Engineering applications are emphasized. <br> COLLEGE: College of Egr \& Computer Sci <br> CRED HR: 3 <br> VAR CRED RANGE: - <br> GRADE SYS: <br> LEVEL: Undergraduate <br> COURSE TYPE: Lecture <br>  <br> Computer Sci <br> QTR EQUIV: ME 408 |
|  | VERSION: REV <br> COURSE: ME4080 - Design Optimization <br> STUDENT REC TITLE: Design Optimization <br> EFFECTIVE: Fall 2012 <br> COURSE DESC: Concepts of minima and maxima; linear, dynamic, integer, and nonlinear programming; variational methods. Engineering applications are emphasized. <br> COLLEGE: College of Egr \& Computer Sci <br> CRED HR: 3 VAR CRED RANGE: 0-0 <br> GRADE SYS: 5 LEVEL: Undergraduate COURSE TYPE: Lecture <br> REP HRS: 0 REP TIMES: 0 <br>  <br> Computer Sci <br> SEM PREREQ: (MTH 2350 or MTH 2530) and ME 3210 <br> XLIST: ME 6080 <br> QTR EQUIV: ME 408 |

*** Click on the WorkFlow button below to go to the Work Flow application

| FORM | COURSE INFORMATION |
| :---: | :---: |
| 9519 <br> STATUS: Process CREATOR: Angela Griffith CREATED: 8/28/12 IN-PROCESS: 10/8/12 WorkFlow | VERSION: CURR <br> COURSE: ME4340 - Computational Fluid Dynamics <br> STUDENT REC TITLE: Computational Fluid Dyna <br> EFFECTIVE: Fall 2012 <br> COURSE DESC: Introduction to CFD methods; governing equations, PDEs, finite difference numerical methods, stability analysis, incompressible and compressible flows, subsonic to supersonic flows. <br> COLLEGE: College of Egr \& Computer Sci <br> CRED HR: 3 <br> VAR CRED RANGE: - <br> GRADE SYS: LEVEL: Undergraduate COURSE TYPE: Lecture <br>  <br> Computer Sci <br> QTR EQUIV: ME 434 |
|  | VERSION: REV <br> COURSE: ME4340 - Simulation of Thermal-Fluids Problems with Advanced Engineering Software <br> STUDENT REC TITLE: Simulation of Thermal-FI <br> EFFECTIVE: Fall 2012 <br> COURSE DESC: In this course students will learn to use commercial computational fluid dynamics software to solve practical engineering problems, including fluid, heat and mass transfer. <br> COLLEGE: College of Egr \& Computer Sci <br> CRED HR: 3 VAR CRED RANGE: 0-0 <br> GRADE SYS: S LEVEL: Undergraduate COURSE TYPE: Lecture <br> REP HRS: 0 REP TIMES: 0 <br>  <br> Computer Sci <br> SEM PREREQ: ME 4010 <br> XLIST: ME 6340 <br> OTR EQUIV: ME 434 |

## Course Inventory Process Tracking - Detail

*** Click on the WorkFlow button below to go to the Work Flow application

| FORM | COURSE INFORMATION |
| :---: | :---: |
| 9497 <br> STATUS: Process <br> CREATOR: Angela Griffith <br> CREATED: 8/27/12 <br> IN-PROCESS: 10/8/12 <br> WorkFlow | VERSION: CURR <br> COURSE: ME4430 - Aeronautics <br> STUDENT REC TITLE: Aeronautics <br> EFFECTIVE: Fall 2012 <br> COURSE DESC: Aviation history. Standard atmosphere, basic aerodynamics, theory of lift, airplane performance, principles of stability and control, and astronautics and propulsion concepts. <br> COLLEGE: College of Egr \& Computer Sci <br> CRED HR: 3 VAR CRED RANGE: - <br> GRADE SYS: LEVEL: Undergraduate COURSE TYPE: Lecture <br>  <br> Computer Sci <br> QTR EQUIV: ME 430 |
|  | VERSION: REV <br> COURSE: ME4430 - Aeronautics <br> STUDENT REC TITLE: Aeronautics <br> EFFECTIVE: Fall 2012 <br> COURSE DESC: Aviation history. Standard atmosphere, basic aerodynamics, theory of lift, airplane performance, principles of stability and control, and astronautics and propulsion concepts. <br> COLLEGE: College of Egr \& Computer Sci <br> CRED HR: 3 VAR CRED RANGE: 0-0 <br> GRADE SYS: S LEVEL: Undergraduate COURSE TYPE: Lecture <br> REP HRS: 0 REP TIMES: 0 <br>  <br> Computer Sci <br> SEM PREREQ: ME 3350 <br> XLIST: ME 6430 <br> QTR EQUIV: ME 430 |

*** Click on the WorkFlow button below to go to the Work Flow application

| FORM | COURSE INFORMATION |
| :---: | :---: |
| 9505 <br> STATUS: Process CREATOR: Angela Griffith CREATED: 8/28/12 IN-PROCESS: 10/8/12 <br> WorkFlow | VERSION: CURR <br> COURSE: ME4740 - Failure Analysis <br> STUDENT REC TITLE: Failure Analysis <br> EFFECTIVE: Fall 2012 <br> COURSE DESC: Engineering aspects of failure analysis, failure mechanisms and related environmental factors, and analysis of actual service failure. <br> COLLEGE: College of Egr \& Computer Sci <br> CRED HR: 3 <br> VAR CRED RANGE: - <br> GRADE SYS: <br> LEVEL: Undergraduate <br> COURSE TYPE: Lecture <br>  <br> Computer Sci <br> QTR EQUIV: ME 470 |
|  | VERSION: REV <br> COURSE: ME4740 - Failure Analysis <br> STUDENT REC TITLE: Failure Analysis <br> EFFECTIVE: Fall 2012 <br> COURSE DESC: Engineering aspects of failure analysis, failure mechanisms and related environmental factors, and analysis of actual service failure. <br> COLLEGE: College of Egr \& Computer Sci <br> CRED HR: 3 VAR CRED RANGE: 0-0 <br> GRADE SYS: S LEVEL: Undergraduate COURSE TYPE: Lecture <br> REP HRS: 0 <br> REP TIMES: 0 <br>  <br> Computer Sci <br> SEM PREREQ: ME 2700, ME 3120, and ME 3610 or equivalent <br> XLIST: ME 6740 <br> QTR EQUIV: ME 470 |

## Course Inventory Process Tracking - Detail

*** Click on the WorkFlow button below to go to the Work Flow application

| FORM | COURSE INFORMATION |
| :---: | :---: |
| 9496 <br> STATUS: Process CREATOR: Angela Griffith CREATED: 8/27/12 IN-PROCESS: 10/8/12 <br> WorkFlow | VERSION: REV <br> COURSE: ME4850 - Nano-scale Science and Engineering <br> STUDENT REC TITLE: Nano-scale Sci and Engr <br> EFFECTIVE: Fall 2012 <br> COURSE DESC: Students will be introduced to Nano-scale science and engineering in terms of the nano-scale building blocks (emphasizing carbon based nano-species), the characterization techniques (emphasizing Raman Spectroscopy), and the nano-phenomena such as thermal, optical, electrical, chemical, and mechanical phenomena observed on the nano-scale. <br> COLLEGE: College of Egr \& Computer Sci <br> CRED HR: 3 VAR CRED RANGE: 0-0 <br> GRADE SYS: S LEVEL: Undergraduate COURSE TYPE: Lecture <br> REP HRS: 0 REP TIMES: 0 <br> SEM PREREQ: ME 2700 and ME 3750 or equivalent knowledge in materials systems and thermodynamics <br> XLIST: ME 6850 |

*** Click on the WorkFlow button below to go to the Work Flow application

| FORM | COURSE INFORMATION |
| :---: | :---: |
| 9543 <br> STATUS: Process CREATOR: Cheryl Thompson <br> CREATED: 9/10/12 <br> IN-PROCESS: 9/17/12 <br> WorkFlow | VERSION: CURR <br> COURSE: NUR4990 - Nursing Honors Independent Study <br> STUDENT REC TITLE: Nur Honors Ind Study <br> EFFECTIVE: Fall 2012 <br> COURSE DESC: Under the guidance of a faculty member, students implement and complete the honors project proposed in NUR 4980. <br> COLLEGE: College of Nursing \& Health <br> CRED HR: 1 <br> VAR CRED RANGE: - <br> GRADE SYS: LEVEL: Undergraduate COURSE TYPE: Independent Study <br>  <br> Health |
|  | VERSION: REV <br> COURSE: NUR4990 - Nursing Honors Independent Study <br> STUDENT REC TITLE: Nur Honors Ind Study <br> EFFECTIVE: Fall 2012 <br> COURSE DESC: Under the guidance of a faculty member, students implement and complete the honors project proposed in NUR 4980. <br> COLLEGE: College of Nursing \& Health <br> CRED HR: 1 VAR CRED RANGE: 0-0 <br> GRADE SYS: S LEVEL: Undergraduate COURSE TYPE: Independent Study <br> REP HRS: 0 <br> REP TIMES: 0 <br> RESTRICTION: Must be enrolled in one of the following Colleges: College of Nursing \& Health <br> SEM PREREQ: NUR 4980 |

*** Click on the WorkFlow button below to go to the Work Flow application

| FORM | COURSE INFORMATION |
| :---: | :---: |
| 5816 <br> STATUS: Process CREATOR: Jerry Clark CREATED: 9/30/10 IN-PROCESS: 9/28/12 WorkFlow | VERSION: CURR <br> COURSE: PHY440 - Introduction to Nanoscience and Nanotechnology <br> STUDENT REC TITLE: Intro Nanosci/Nanotech <br> EFFECTIVE: Winter 2011 <br> COURSE DESC: Introduction to nanoscience and technology. Topics include introduction to quantum mechanics, fabrication, characterization, materials, electronic properties, optical properties, magnetic properties, devices, MEMS and NEMS. <br> COLLEGE: College of Science \& Math <br> CRED HR: 4 <br> VAR CRED RANGE: - <br> GRADE SYS: LEVEL: Undergraduate <br> COURSE TYPE: Lecture <br> QTR PREREQ: PHY 240 and PHY 242 and PHY 244 <br> QTR EQUIV: PHY 440 |
|  | VERSION: REV <br> COURSE: PHY4400 - Introduction to Nanoscience and Nanotechnology <br> STUDENT REC TITLE: Intro Nanosci/Nanotech <br> EFFECTIVE: Spring 2013 <br> COURSE DESC: Introduction to nanoscience and technology. Topics include introduction to quantum mechanics, fabrication, characterization, materials, electronic properties, optical properties, magnetic properties, devices, MEMS and NEMS. <br> COLLEGE: College of Science \& Math <br> CRED HR: 3 VAR CRED RANGE: 0-0 <br> REP HRS: 0 <br> REP TIMES: 0 <br> SEM PREREQ: PHY 2410 <br> QTR PREREQ: PHY 240 and PHY 242 and PHY 244 <br> QTR EQUIV: PHY 440 |

## Course Inventory Process Tracking - Detail

*** Click on the WorkFlow button below to go to the Work Flow application

| FORM | COURSE INFORMATION |
| :---: | :---: |
| 9531 <br> STATUS: Process CREATOR: Donna Schlagheck <br> CREATED: 9/4/12 <br> IN-PROCESS: 9/27/12 <br> WorkFlow | VERSION: CURR <br> COURSE: PLS4440 - Topics in Criminal Justice <br> STUDENT REC TITLE: Topics Criminal Justice <br> EFFECTIVE: Fall 2012 <br> COURSE DESC: Problems, approaches, and topics in the field of criminal justice and legal studies. Topics vary. Integrated Writing course. <br> COLLEGE: College of Liberal Arts <br> CRED HR: 3 <br> VAR CRED RANGE: - <br> GRADE SYS: <br> LEVEL: Undergraduate <br> COURSE TYPE: Lecture <br> QTR EQUIV: PLS 4440 |
|  | VERSION: REV <br> COURSE: PLS4440 - Topics in Criminal Justice <br> STUDENT REC TITLE: Topics Criminal Justice <br> EFFECTIVE: Fall 2012 <br> COURSE DESC: Problems, approaches and topics in the field of criminal justice. Topics vary. <br> Integrated Writing course. <br> COLLEGE: College of Liberal Arts <br> REP TIMES: 999 <br> RESTRICTION: Political science major or minor; criminal justice major or minor. <br> QTR EQUIV: PLS 4440 |

## Course Inventory Process Tracking - Detail

*** Click on the WorkFlow button below to go to the Work Flow application

| FORM | COURSE INFORMATION |
| :---: | :---: |
| 9541 <br> STATUS: Process <br> CREATOR: Richard Mercer <br> CREATED: 9/6/12 <br> IN-PROCESS: 9/28/12 <br> WorkFlow | VERSION: REV <br> COURSE: STT4310 - Statistical Methods for Clinical Trials <br> STUDENT REC TITLE: Stat Meth Clinical Trial <br> EFFECTIVE: Spring 2013 <br> COURSE DESC: Basic clinical design methodology, types of clinical trials, analysis of trial data, and statistical issues that commonly arise in clinical trials. <br> COLLEGE: College of Science \& Math <br> CRED HR: 3 VAR CRED RANGE: 0-0 <br> GRADE SYS: S LEVEL: Undergraduate COURSE TYPE: Lecture <br> REP HRS: 0 REP TIMES: 0 <br> SEM PREREQ: STT 3610 or STT 4300 <br> XLIST: STT 6310 |

*** Click on the WorkFlow button below to go to the Work Flow application

| FORM | COURSE INFORMATION |
| :---: | :---: |
| 9593 <br> STATUS: Process CREATOR: Carl Brun CREATED: 9/19/12 IN-PROCESS: 10/3/12 WorkFlow | VERSION: CURR <br> COURSE: SW4870 - Social Work Field Seminar I <br> STUDENT REC TITLE: SW Field Seminar I <br> EFFECTIVE: Fall 2012 <br> COURSE DESC: Faculty-field liaison utilizes individual and group feedback to assist students in applying generalist social work practice knowledge while planning, implementing, and processing activities at their practicum sites. <br> COLLEGE: College of Liberal Arts <br> CRED HR: 3 <br> VAR CRED RANGE: - <br> GRADE SYS: LEVEL: Undergraduate COURSE TYPE: Seminar <br> RESTRICTION: Must be enrolled in one of the following Majors: Social Work |
|  | VERSION: REV <br> COURSE: SW4870 - Social Work Field Seminar I <br> STUDENT REC TITLE: SW Field Seminar I <br> EFFECTIVE: Fall 2012 <br> COURSE DESC: Faculty-field liaison utilizes individual and group feedback to assist students in applying generalist social work practice knowledge while planning, implementing, and processing activities at their practicum sites. Integrated Writing course. <br> COLLEGE: College of Liberal Arts <br> CRED HR: $3 \quad$ VAR CRED RANGE: 0-0 WRIT INT: $Y$ <br> GRADE SYS: S LEVEL: Undergraduate COURSE TYPE: Seminar <br> REP HRS: 0 <br> REP TIMES: 0 <br> RESTRICTION: Must be enrolled in one of the following Majors: Social Work <br> SEM PREREQ: SW 3700 and SW 3750 and SW 3800 and SW 4900 <br> COREQ: SW 4860, SW 4810 |

*** Click on the WorkFlow button below to go to the Work Flow application

| FORM | COURSE INFORMATION |
| :---: | :---: |
| 9608 <br> STATUS: Process <br> CREATOR: Bruce Cromer <br> CREATED: 9/20/12 <br> IN-PROCESS: 10/1/12 <br> WorkFlow | VERSION: CURR <br> COURSE: TH3800 - Theatre History and Literature I <br> STUDENT REC TITLE: History and Lit I <br> EFFECTIVE: Fall 2012 <br> COURSE DESC: Explores a variety of theatrical texts and pertinent history from early historical eras. <br> COLLEGE: College of Liberal Arts <br> CRED HR: 3 VAR CRED RANGE: - <br> GRADE SYS: LEVEL: Undergraduate COURSE TYPE: Lecture <br> RESTRICTION: Must be enrolled in one of the following Classifications: Senior Junior QTR EQUIV: TH 399 |
|  | VERSION: CURR <br> COURSE: TH3990 - Studies in Selected Subjects <br> STUDENT REC TITLE: Selected Subjects <br> EFFECTIVE: Fall 2012 <br> COURSE DESC: Variable content dealing with problems, approaches, and topics in the field of theatre. <br> QTR EQUIV: TH 399 |
|  | VERSION: REV <br> COURSE: TH3990 - Studies in Selected Subjects <br> STUDENT REC TITLE: Selected Subjects <br> EFFECTIVE: Fall 2012 <br> COURSE DESC: Variable content dealing with problems, approaches, and topics in the field of theatre. <br> COLLEGE: College of Liberal Arts <br> REP HRS: 0 <br> REP TIMES: 999 <br> QTR EQUIV: TH 399 |

Program of Study Workflow - Process Tracking

| WF | $\begin{aligned} & \text { WF } \\ & \text { ID } \end{aligned}$ | PROCESS | DATE | COLLEGE | LEVEL | DEGREE | PROGRAM | MAJOR | CONCENTRATION | ATTRIBUTE | ADDITIONAL | ORIGINATOR | $\begin{aligned} & \text { FORM } \\ & \text { OP } \end{aligned}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Workflow | 9431 | UCAP_Eval | 10/8/12 | EG | UG | BSCE | Computer Engineering BSCE | Computer Engineering |  |  |  | Wendy Chetcuti | Modify |
| Workflow | 3442 | UCAP_Eval | 10/2/12 | LA | UG |  |  |  |  |  | Full proposal attached | David Barr | New |
| Workflow | 9548 | UCAP_Eval | 9/28/12 | SM | UG | BA | Biological Sciences - BA | Biological Sciences |  |  | Life Science Education | Laura Buerschen | Modify |
| Workflow | 9146 | UCAP_Eval | 9/28/12 | SM | UG | BS | Chemistry - BS | Chemistry |  |  | Dual Major | David Grossie | Modify |

## Academic Program Quarter to Semester Conversion and New Semester Program

| College | Engineering and Computer Science |
| :--- | :--- |
| Department | Computer Science and Engineering |
| Degree (A.A. B.S., B.F.A., etc.) \& Title | B.S. in Computer Engineering |
| Concentration, Track, Option, Specialization | n/a |
| Minor Program Title | n/a |
| Certificate Program Title | n/a |


| Quarter System Program |  | Semester System Program |  |
| :---: | :---: | :---: | :---: |
|  | Hours |  | Hours |
| I. General Education | 40 | I. Wright State Core Communications: | 42 6 |
| Area I - Communication and Mathematical Skills <br> ENG 101 - Composition I <br> ENG 102 - Composition II <br> Mathematics (satisfied by Math/Stat section) <br> Area II - Cultural-Social Foundations <br> Area III - Human Behavior <br> Area IV - Human Expression <br> Additional courses from Areas II, III, and IV <br> Area V - Natural Sciences <br> Satisfied by required physics courses <br> Area VI - College Component <br> Select one course from the following: <br> EC 290 Economics <br> ISE 210 Engineering Perspectives (preferred) <br> PSY 110 Psychology: Science and Practice <br> URS 200 Growth and Change in Urban Society | 8 8 8 8 4 8 8 4 | ENG 1100 (3) <br> EGR 3350 (3) - Technical Communication for <br> Engineers and Scientists <br> Mathematics: MTH 2300 (4) <br> Global Traditions: 6 hours <br> Arts/Humanities: 3 hours <br> Social Science: 6 hours <br> Natural Science: <br> PHY 2400/2400L (5) <br> PHY 2410/2410L(5) <br> Additional Core Courses <br> MTH 2310 Calculus II (4) <br> Additional courses in MTH, STT, CHM, BIO, PHY, or EES appropriate for science or engineering majors. (3) | 4 6 3 6 10 |


| II. Computer Science and Engineering Courses | 87 | II. Computer Science and Engineering Courses | 59 |
| :---: | :---: | :---: | :---: |
| A. Required Computer Science Courses CS 240 Computer Programming I CS 241 Computer Programming II CS 242 Computer Programming III CS 400 Data Structures and Algorithms CS 415 Social Implications of Computing | 19 | A. Required Computer Science Courses CS 1180 Computer Science I (4) or CS 1161 Intro to Computer Programming II (4) <br> CS 1181 Computer Science II (4) <br> CS 3100 Data Structures and Algorithms (3) | 14 |
| B. Required Computer Engineering Courses CEG 233 Linux and Windows CEG 260 Digital Circuits CEG 320 Computer Organization CEG 360 Digital System Design CEG 402 Introduction to Computer Networks CEG 433 Operating Systems CEG 453 Embedded Systems CEG 498 Team Projects I and II | 36 | CS 4000 Social Implications of Computing (3) <br> B. Required Computer Engineering Courses CEG 2350 OS Concepts and Usage (4) CEG 3310 Computer Organization (4) CEG 3320 Digital System Design (4) <br> CEG 4330 Microprocessor-Based Embedded Systems (4) <br> CEG 4980/4981 Team Projects I and II (6) | 22 |
| C. CS/CEG Electives (400-level) | 16 | C. CS/CEG/EE Electives (3000 level or higher) At least 9 hours must be at the 4000 level | 12 |
| D. Other Required Engineering Courses EE 301/302 Circuit Analysis I \& Lab EE 321 Linear Systems I EE 331/332 Electronic Devices \& Lab | 13 | D. Other Required Engineering Courses EE 2010/2010L Circuit Analysis I \& Lab (4) EE 3210 Linear Systems (3) EE 3310/3310L Electronic Devices \& Lab (4) | 11 |
| E. Technical Communication EGR 335 Technical Communications | 3 |  |  |
| III. Mathematics and Science Courses | 48 | III. Mathematics and Science Courses | 13 |
| A. Required Mathematics/Statistics Courses MTH 229 Calculus I <br> MTH 230 Calculus II <br> MTH 231 Calculus III <br> MTH 253 Matrix Algebra <br> MTH 257 Discrete Mathematics <br> STT 363, STT 360, or ISE 301 Statistics <br> MTH 233 Differential Equations <br> OR MTH 235 Differential Equations with Matrix Algebra | 29 | A. Required Mathematics/Statistics Courses MTH 2350 Differential Equations with Matrix Algebra (4) <br> MTH 2570 Discrete Math for Computing (3) or <br> CS 2200 Discrete Structures and their Algorithms <br> (3) <br> STT 3600 or ISE 2211 Statistics (3) | 10 |
| B. Required Physics Courses <br> PHY 240/200 <br> PHY 242/202 <br> PHY 244/204 | 16 |  |  |
| C. Science and Mathematics Electives | 3 |  |  |
| IV. General Electives Electives may be from any area of study | 16 | IV. General Electives Electives may be from any area of study approved by the Department of Computer Science and Engineering | 9 |
| Total | 191 | Total | 120 |

## Notes:

## Academic Program Quarter to Semester Conversion and New Semester Program

| College | Liberal Arts |
| :--- | :--- |
| Department | Philosophy |
| Degree (A.A. B.S., B.F.A., etc.) \& Title |  |
| Concentration, Track, Option, Specialization |  |
| Minor Program Title | history and philosophy of science |
| Certificate Program Title |  |


| Quarter System Program | Hours |
| :--- | :--- |
| I. General Education |  |
|  |  |
| II. |  |
|  |  |
|  |  |




Notes:

# Proposal for a Minor in History and Philosophy of Science (HPS) Contact: Prof. Erik C. Banks 

1. Title: History and Philosophy of Science Minor, Philosophy Department

## 2. Objectives:

To give Wright State Students a chance to explore the field of HPS, an important and well established field with departments at many universities in America and abroad. This minor is designed to attract two kinds of students. Students in the liberal arts will be able to gain exposure to the methods and history of the sciences and become familiar with scientific reasoning and methodology at an advanced level. Science students will be able to learn more about the history of their discipline and ask questions about fundamental philosophical issues related to science, including important ethical questions, which cannot be covered in more traditional science education. The creation of this minor is student-driven and should exist only because there are students who want it to. Several past students of mine have asked why there is no track in philosophy of science specifically for this purpose (see attached testimonials).

## 3. Catalogue Description:

The minor in History and Philosophy of Science (HPS) explores the history, methods, and philosophy of the sciences. Students will learn methods of logic, experimental methodology, and inductive reasoning techniques. They will then choose from a number of more advanced courses, with topics including history of science and technology, space and time, philosophy of physics, causation, philosophy of psychology, ethics of medicine, and other areas.

## 4. Admission Requirements: Approval and $\mathbf{B}$ or better in

PHL 2230 Symbolic Logic I, or PHL 3230 Symbolic Logic II, or PHL 4710 Philosophy of Science, or PHL 2150 Inductive Logic, or an advanced philosophy course (level 3000 or higher).

## 5. Program Requirements:

HPS minor (assuming 3 credit hours per course):<br>1 Required Course (3 hrs): ONE from:<br>PHL 2230 Symbolic Logic I<br>PHL 3230 Symbolic Logic II<br>PHL 4710 Philosophy of Science<br>PHL 2150 Inductive Logic

```
5 Electives ( 15 hrs.) All advanced courses 3000 or higher: FIVE FROM
PHL 3510 Scientific Revolutions
PHL 3990 Space and Time
PHL 3990 Kant's Critique of Pure Reason
PHL 3990 Rationalism and Empiricism
PHL 3990 Philosophy and Modern Physics
PHL 3670 Philosophy of Mind
PHL 3780 Bioethics
PHL 3990 Causation and Causal Inference
PHL 3990 Philosophy of Mathematics
PHL 4240 Philosophy of Language and Logic
PHL 3990 Philosophy of Biology/ Evolution
PHL 4810 Advanced Study in HPS
PHL/CLS 3990 Ancient Science
PHL/HIS 3990 History of Science and Technology (STS)
```

AND an additional lab science course (4 credits) beyond those required for WSU core, or an additional math course which is not required for WSU nor a remedial course.
(Automatic for science students.)
Total Hours: 18 (22 for Liberal Arts Students)

## Course Descriptions

## PHL 2150: Inductive Logic

Introduction to the techniques of inductive and probabilistic reasoning with an emphasis on the problem encountered in attempting to justify those techniques.
*This course fulfills the College of Liberal Arts’ Research Methods requirement.
3.00 Credit hours

## PHL 2230: Symbolic Logic I

Introduction to the techniques of deductive logic including truth-table analysis, the propositional calculus, and predicate logic.
*This course counts towards the logic requirement of the Philosophy major and minor.
*This course fulfills the College of Liberal Arts Research Methods requirement.
3.00 Credit hours

## PHL 3230: Symbolic Logic II

Standard notations, principles of inference, formal systems, and methods of proof. Focus on first-order predicate logic.
*This course counts towards the logic requirement of the Philosophy major and minor.
*This course fulfills the College of Liberal Arts' Research Methods requirement.
3.00 Credit hours

PHL 3510: Scientific Revolutions
A look at dramatic paradigm shifts in the history of science including Newton, Einstein, Darwin and beyond, possibly including emerging scientific revolutions today.
*This course is writing intensive.
3.00 Credit hours

## PHL 3670: Philosophy of Mind

Examination of central issues in the philosophy of mind: the nature of mind, the mindbrain relation, knowledge of other minds, intentionality, consciousness, agency, and subjectivity.
*This course is writing intensive.
3.00 Credit hours

PHL 3780: Bioethics
An examination of some of the ethical issues that arise in a medical context, especially those dealing with life and death. Topics may include abortion, euthanasia, the allocation of scare medical resources, and human cloning.
*This course is writing intensive.
3.00 Credit hours

## PHL 4240: Philosophy of Language and Logic

Topics may include the nature of a priori knowledge, logical inference, infinity, the paradoxes of Russell, the sorites and the liar, the concept of truth, problems in the foundations of mathematics and computer science and questions such as: could a computer think?
*This course is writing intensive.
3.00 Credit hours

## PHL 4710: Philosophy of Physical Science

A course for non-science majors to develop an appreciation for the methods, history and breakthroughs in the natural sciences.
*This course fulfills the College of Liberal Arts' Research Methods requirement.
3.00 Credit hours

## 6. Program Quality:

The HPS minor has reasonably easy requirements for admission, but difficulty increases very steeply in the electives, which are all 3000 level courses, many of them variable topic courses in the PHL 3990 category.

## 7. Student Performance

No grade lower than a C in any course will be acceptable if it is to count for the minor. No more than one C in any course in the minor will be considered acceptable towards completion of the requirements.

## 8. Curriculum Coordination

The minor in HPS will be managed by the philosophy department. We strongly encourage collaboration with different departments (history, physics, mathematics, social sciences). Our courses will be cross-listed as much as possible, and cross-listed courses from other departments will count toward satisfaction of the elective requirement for this program, though not the entry requirements or the required courses, which must be done in philosophy. The minor has been developed in consultation with other departments from whom letters of support are appended. We will assume that a typical science student interested in this minor will be willing to do an extra class beyond their electives.

## 9. Resource Coordination

The program will be coordinated by Professor Banks in philosophy. My conservative estimate is that five students per year might graduate with this minor. Since these students would not otherwise do a philosophy minor or major, the proposed minor would not draw students away from our present program but would rather increase the absolute number of students doing philosophy. There is no overlap with our current history of philosophy minor. No additional resources are needed, either from Liberal Arts, CATS or the library. The program has the option of pursuing outside funding for course development, speakers, conferences and other scholarly activities.

## 10. Program Staffing

Although the majority of courses are taught by me (Prof. Banks), other courses are included, such as most of Prof. Irvine's courses, Prof. Wilson's medical ethics, and a team taught course in Ancient Science. Other appropriate courses can also be added to the minor, such as History of Science and Technology. Based on informal conversations, the following faculty wish to be involved:

Philosophy: Profs. Banks, Irvine, and Wilson
History and STS: Profs. Winkler and Dane Daniels
Classics: Profs. Edwards and Aaron Wolpert

The minor is flexible. Collaborations are very welcome. As other cross-listed and team taught courses become available they can be considered and counted toward the minor on a case by case basis.

## 11. Letters of Support:

## A. Biology

Date: June 20, 2012
From: David Goldstein, Chair, Biology Department
To: Erik Banks
Re: philosophy Minor
I have run this curriculum past our advisors. their reply:
"Our BS students would have to take the majority (if not all) of these courses outside of their degree requirements (some may be able to use some of their general elective hours, but most of these are completed with math pre-reqs and learning community credits). The only one I could see counting is their PHL 3780: Bioethics (the dept could agree to accept this since we offer a similar course). Are many of the PHL courses offered in the summer? If so, I could see students complete the minor along with their major requirements still in 4 years.

Our BA students should be able to fit this in their program requirements nicely. The only downside is that we don't have that many BA students."

So: It seems like the program is good to go from our end. I will hope that we can encourage interest in it, it's a nice addition to our offerings.
-David

## B. Physics

Date: June 18, 2012
From: Lok Lew Yan Voon, Chair, Physics Department
To: Erik Banks
Re: History and Philosophy of Science Minor
Hi Erik,
Our BA (BS) students have 18 (15) CH of electives so the BS students will have to take an extra class and also have no further choice but I guess that might be acceptable.
Regards,
Lok

## C. Student Letters

October 10, 2011

## To Whom it May Concern:

Dr. Banks has asked me to comment on the idea of a proposed minor in Philosophy and Scientific methods. Let me do so by showing how it would have fit my educational plans.

I transferred to Wright State after my freshman year as a physics major with an interest in philosophy. The second philosophy course I took at Wright State was Dr. Banks' PHL 471 Philosophy of Physical Science, which opened my eyes as a science student. By the end of the quarter I had declared philosophy as a second major.

One reason for this was to set a goal to learn a sufficient amount of philosophy before I continued on my career in science. Another reason was because the philosophy minor had restrictions that made it difficult to satisfy. The history of philosophy courses were offered too sporadically and would conflict with my science and math courses, or the science philosophy class I wanted to take would not count towards the minor because it was in the research methods category that had already been satisfied. I would certainly have been benefited by having the option of a minor in philosophy and scientific methods.

Combining philosophy with science made me more competitive for graduate school. I was told during a summer internship by Eric Mazur, a Harvard University professor of physics and applied physics, that they look for applicants that can do more than physics. My immediate response was, "then I'm perfect." I explained to him that I was earning separate degrees in physics and philosophy, and also did music and art as a creative outlet. I am now a graduate student in applied physics at Harvard. Having a background in philosophy has strengthened my problem solving and critical thinking ability. It has helped my ability to think abstractly and creatively as well. All of these are very beneficial for scientists.

Zach Gault
Wright State University Class of 2011

April 5, 2012
To Whom it May Concern,
As a physics student at Wright State University, I am in full support of introducing the option of a minor in Philosophy of Science. Had this option been available in my undergrad, I would have taken full advantage of it.

Throughout the course of my undergraduate career I had taken a few philosophy courses where the concentration focused on areas like scientific revolutions, paradigms in classical physics, and relativity. Despite having taken physics classes where these same topics were covered, the physics classes tend to be more method driven and formulaic in nature. The discussion of the physical significance of problems is often skipped over entirely. Take for example, the theory of relativity. I was taught in my physics courses how to accurately calculate length contractions and time dilations for objects moving at near light speed, however these calculations give very little visualization of the scenario. This same topic was covered in a philosophy course (Prof. Banks' PHL 399 Space and Time) where we discussed the physical consequences, paradoxes, and problems of "which observation happened first?" when objects move at near light speeds. In retrospect, my education on several topics in my physics courses was incomplete because they lacked the discussion and visualization that many of my philosophy courses provided. Only after having both aspects (the formulation and the physical visualization) presented that I feel I have begun to see the whole picture. A minor in Philosophy of Science provides a different way of looking at phenomena of which many scientists are already familiar, but have not really delved deeply into. It would also provide good training in learning how to think about phenomena beyond the formulas that represent them.

Sincerely yours,
Lindsay Marie Owens
Entering graduate school in physics, Rice University

November 30, 2011
To Whom it May Concern,
I am writing in support of Dr. Banks’ proposal of a philosophy of science minor at Wright State University.
I believe that philosophy and science complement each other in a way that is often unknown to scientists like myself. The philosophy courses I took at Wright State greatly enriched my education. Science - its methods, its history, its impact society - I now view with a new set of eyes. I support the formation of this new minor, as I feel that many will benefit from what it has to offer. I'm just disappointed this option did not exist when I was a student.

Sincerely yours,
Leah Kershner

Wright State Honors Student and Currently Ph.D. student in Biology at Kent State University

## Academic Program Quarter to Semester Conversion

| College | Science and Mathematics |
| :--- | :--- |
| Department | Biological Sciences |
| Degree, Major Program | Bachelor of Arts/Life Science Education |

\begin{tabular}{|c|c|c|c|}
\hline Quarter System \& \& Semester System \& \\
\hline \& Hours \& \& Hours \\
\hline \begin{tabular}{l}
I. General Education \\
BIO 111, 112, 115 \\
MTH 228 and 229 and 230, or STT 264 and 265 \\
AREA VI \\
EES 260 or PSY110 or SM101 or SM 205
\end{tabular} \& 42 \& \begin{tabular}{l}
I. Wright State Core \\
Element 1: Communication \\
Element 2: Mathematics \\
STT 2640 required \\
Element 3: global Traditions \\
Element 4: Arts and Humanities \\
Element 5: Social Sciences \\
Element 6: Natural Sciences \\
BIO 1120, 1150 required \\
Additional Core Courses \\
CHM 1210, 1210L, 1220, 1220L required
\end{tabular} \& 43
4

8
8
10 <br>

\hline II. Departmental Requirements BIO 111, 112, 115 BIO 210, 211, 212, 213, 230, 231, 492 \& \[
$$
\begin{aligned}
& 12 \\
& 25
\end{aligned}
$$

\] \& | II. Departmental Requirements |
| :--- |
| BIO 2100, 2110, 2120, 2130, 2140, 2310, Senior Capstone Experience (BIO4000, or 4020 or 4920) | \& 17 <br>


\hline | III. Departmental Electives |
| :--- |
| Area D |
| Selected from 300- and 400-level BIO, M\&I, or EXB prefix courses |
| BIO 399 (5 to 7 credits) |
| BIO 499 (1 to 3 credits) |
| EES 251/252, 253/254, 255/256 | \& 40 \& | III. Departmental Electives |
| :--- |
| Selected 15 semester hours from 3000- and 4000level BIO, M\&I or EXB courses. At least one course must include a lab component. |
| 5 cr hrs of BIO 3990 or 4990 must be included | \& 15 <br>


\hline | IV. Related Requirements |
| :--- |
| CHM 121/125, 122/126, 123/127, 211/215, 212/216, 213/217 |
| PHY 111/101, 112/102, 113/103 |
| MTH 228, STT264 \& 265 |
| OR |
| MTH 229, 230, 231 | \& \[

$$
\begin{gathered}
33 \\
15 \\
13-15
\end{gathered}
$$

\] \& | IV. Related Requirements (non-departmental) |
| :--- |
| CHM 2110, 2110L, 2120, 2120L |
| EES 3450, 3460 |
| PHY 1110, 1110L, 1120, 1120L |
| MTH 1340 | \& | 32 |
| :--- |
| 10 |
| 7 |
| 10 |
| 5 | <br>


\hline | V. Phase I Professional Education Courses |
| :--- |
| ED 221, 223, 301, 303, EDS 333 | \& 16 \& | V. College Requirement for Bachelor of Arts |
| :--- |
| Complete a minimum of 18 semester hours in departments outside CoSM and CECS. Must include Phase I Professional Education |
| Courses: ED 2270, 2600, 2700, 2650, 2750, EDS 2900 | \& 18 <br>

\hline Total \& 187 \& Total \& 125 <br>
\hline
\end{tabular}

## Notes:

**For graduation credit, a grade of C or better required for all Departmental, Supporting and Elective science and math courses.

College of Science and Mathematics
$\begin{array}{ll}\text { Department: } & \text { CHEMISTRY } \\ \text { Major Program: } & \text { B.S. CHEMISTRY-Dual Major } \\ \text { Concentration: } & \text { Chemistry }\end{array}$

| Quarters |  |
| :---: | :---: |
|  | Hours |
| I. Wright State Core | 42 |
| Element 1: Communication ENG 2100 -Sciences section required | 6 |
| Element 2: Mathematics <br> MTH 2300 required | 4 |
| Element 3: Global Traditions | 6 |
| Element 4: Arts and Humanities | 3 |
| Element 5: Social Sciences | 6 |
| Element 6: Natural Sciences | 10 |
| CHM 1210, 1210L, 1220, 1220L required Additional Core Courses MTH 2310 required | 7 |
| II. Departmental Core Requirements CHM 2110, 2110L, 2120, 2120L CHM 3120, 3120L | 17 |
| III. Departmental Requirements and Electives CHM 3510, 3510L, 3520, 3520L | 10 |
| IV. Related Course Requirements <br> MTH 2320 <br> PHY 2400/2400L, PHY 2410/2410L or <br> PHY 1110/1110L, PHY 1120/1120L <br> Second component of Dual Major (36 hours) | 50 |
| V. General Electives | 1 |
| Total | 120 |


| Semesters |  |
| :---: | :---: |
|  | Hours |
| I. Wright State Core | 42 |
| Element 1: Communication ENG 2130 required | 6 |
| Element 2: Mathematics MTH 2300 required | 4 |
| Element 3: Global Traditions | 6 |
| Element 4: Arts and Humanities | 3 |
| Element 5: Social Sciences | 6 |
| Element 6: Natural Sciences | 10 |
| CHM 1210, 1210L, 1220, 1220L required Additional Core Courses <br> MTH 2310 required | 7 |
| II. Departmental Core Requirements CHM 2110, 2110L, 2120, 2120L CHM 3120, 3120L | 15 |
| III. Departmental Requirements and Electives CHM 3510, 3510L, 3520, 3520L | 10 |
| IV. Related Course Requirements <br> MTH 2320 <br> PHY 2400/2400L, PHY 2410/2410L or <br> PHY 1110/1110L, PHY 1120/1120L <br> Second component of Dual Major (36 hours) | 50 |
| V. General Electives | 1 |
| Total | 120 |


| College | Liberal Arts |
| :--- | :--- |
| Department | Philosophy |
| Degree (A.A. B.S., B.F.A., etc.) \& Title |  |
| Concentration, Track, Option, Specialization |  |
| Minor Program Title | history and philosophy of science |
| Certificate Program Title |  |


| Quarter System Program |  |
| :--- | :--- |
| I. General Education | Hours |
| II. |  |
|  |  |
| Total |  |


| Semester System Program | Hours |
| :--- | :--- |
| I. Wright State Core |  |
|  |  |
| II. minor requirements | 3 |
| 1 Required Course (3 hrs): ONE from: |  |
| PHL 2230 Symbolic Logic I |  |
| PHL 3230 Symbolic Logic II |  |
| PHL 4710 Philosophy of Science |  |
| PHL 2150 Inductive Logic |  |
| 5 Electives (15 hrs.) All advanced courses | 15 |
| 3000 or higher: FIVE FROM |  |
| PHL 3510 Scientific Revolutions |  |
| PHL 3990 Space and Time |  |
| PHL 3990 Kant's Critique of Pure Reason |  |
| PHL 3990 Rationalism and Empiricism |  |
| PHL 3990 Philosophy and Modern Physics |  |
| PHL 3670 Philosophy of Mind |  |
| PHL 3780 Bioethics |  |
| PHL 3990 Causation and Causal Inference |  |
| PHL 3990 Philosophy of Mathematics |  |
| PHL 4240 Philosophy of Language and Logic |  |
| PHL 3990 Philosophy of Biologyl Evolution |  |
| PHL 4810 Advanced Study in HPS |  |
| PHL/CLS 3990 Ancient Science |  |
| PHL/HIS 3990 History of Science and |  |
| Technology (STS) |  |
| Non-science Majors need 1 additional course, |  |
| either a Lab Science course or a Math course |  |
| (200 level or above). |  |
| Total Hrs 18-22 |  |
| III. |  |
|  |  |
| Total |  |
|  |  |

## Notes:

## 1. Title: History and Philosophy of Science Minor, Philosophy Department

## 2. Objectives:

To give Wright State Students a chance to explore the field of HPS, an important and well established field with departments at many universities in America and abroad. This minor is designed to attract two kinds of students. Students in the liberal arts will be able to gain exposure to the methods and history of the sciences and become familiar with scientific reasoning and methodology at an advanced level. Science students will be able to learn more about the history of their discipline and ask questions about fundamental philosophical issues related to science, including important ethical questions, which cannot be covered in more traditional science education. The creation of this minor is student-driven and should exist only because there are students who want it to. Several past students of mine have asked why there is no track in philosophy of science specifically for this purpose (see attached testimonials).

## 3. Catalogue Description:

The minor in History and Philosophy of Science (HPS) explores the history, methods, and philosophy of the sciences. Students will learn methods of logic, experimental methodology, and inductive reasoning techniques. They will then choose from a number of more advanced courses, with topics including history of science and technology, space and time, philosophy of physics, causation, philosophy of psychology, ethics of medicine, and other areas.
4. Admission Requirements: Approval and $B$ or better in

PHL 2230 Symbolic Logic I, or PHL 3230 Symbolic Logic II, or PHL 4710 Philosophy of Science, or PHL 2150 Inductive Logic, or an advanced philosophy course (level 3000 or higher).

## 5. Program Requirements:

[^0]Total Hours: 18 (22 for non-science majors)

## Course Descriptions

PHL 2150: Inductive Logic

Introduction to the techniques of inductive and probabilistic reasoning with an emphasis on the problem encountered in attempting to justify those techniques.
*This course fulfills the College of Liberal Arts' Research Methods requirement.
3.00 Credit hours

## PHL 2230: Symbolic Logic I

Introduction to the techniques of deductive logic including truth-table analysis, the propositional calculus, and predicate logic.
*This course counts towards the logic requirement of the Philosophy major and minor.
*This course fulfills the College of Liberal Arts Research Methods requirement.
3.00 Credit hours

## PHL 3230: Symbolic Logic II

Standard notations, principles of inference, formal systems, and methods of proof. Focus on first-order predicate logic.
*This course counts towards the logic requirement of the Philosophy major and minor.
*This course fulfills the College of Liberal Arts' Research Methods requirement.
3.00 Credit hours

## PHL 3510: Scientific Revolutions

A look at dramatic paradigm shifts in the history of science including Newton, Einstein, Darwin and beyond, possibly including emerging scientific revolutions today.
*This course is writing intensive.
3.00 Credit hours

## PHL 3670: Philosophy of Mind

Examination of central issues in the philosophy of mind: the nature of mind, the mind-brain relation, knowledge of other minds, intentionality, consciousness, agency, and subjectivity.
*This course is writing intensive.
3.00 Credit hours

## PHL 3780: Bioethics

An examination of some of the ethical issues that arise in a medical context, especially those dealing with life and death. Topics may include abortion, euthanasia, the allocation of scare medical resources, and human cloning.
*This course is writing intensive.
3.00 Credit hours

## PHL 4240: Philosophy of Language and Logic

Topics may include the nature of a priori knowledge, logical inference, infinity, the paradoxes of Russell, the sorites and the liar, the concept of truth, problems in the foundations of mathematics and computer science and questions such as: could a computer think?
*This course is writing intensive.
3.00 Credit hours

## PHL 4710: Philosophy of Physical Science

A course for non-science majors to develop an appreciation for the methods, history and breakthroughs in the natural sciences.
*This course fulfills the College of Liberal Arts' Research Methods requirement.
3.00 Credit hours

## 6. Program Quality:

The HPS minor has reasonably easy requirements for admission, but difficulty increases very steeply in the electives, which are all 3000 level courses, many of them variable topic courses in the PHL 3990 category.

## 7. Student Performance

No grade lower than a C in any course will be acceptable if it is to count for the minor. No more than one $C$ in any course in the minor will be considered acceptable towards completion of the requirements.

## 8. Curriculum Coordination

The minor in HPS will be managed by the philosophy department. We strongly encourage collaboration with different departments (history, physics, mathematics, social sciences). Our courses will be cross-listed as much as possible, and cross-listed courses from other departments will count toward satisfaction of the elective requirement for this program, though not the entry requirements or the required courses, which must be done in philosophy. The minor has been developed in consultation with other departments from whom letters of support are appended. We will assume that a typical science student interested in this minor will be willing to do an extra class beyond their electives.

## 9. Resource Coordination

The program will be coordinated by Professor Banks in philosophy. My conservative estimate is that five students per year might graduate with this minor. Since these students would not otherwise do a philosophy minor or major, the proposed minor would not draw students away from our present program but would rather increase the absolute number of students doing philosophy. There is no overlap with our current history of philosophy minor. No additional resources are needed, either from Liberal Arts, CATS or the library. The program has the option of pursuing outside funding for course development, speakers, conferences and other scholarly activities.

## 10. Program Staffing

Although the majority of courses are taught by me (Prof. Banks), other courses are included, such as most of Prof. Irvine's courses, Prof. Wilson's medical ethics, and a team taught course in Ancient Science. Other appropriate courses can also be added to the minor, such as History of Science and Technology. Based on informal conversations, the following faculty wish to be involved:

Philosophy: Profs. Banks, Irvine, and Wilson
History and STS: Profs. Winkler and Dane Daniels
Classics: Profs. Edwards and Aaron Wolpert
The minor is flexible. Collaborations are very welcome. As other cross-listed and team taught courses become available they can be considered and counted toward the minor on a case by case basis.

## 11. Letters of Support:

## A. Biology

Date: June 20, 2012
From: David Goldstein, Chair, Biology Department
To: Erik Banks
Re: philosophy Minor
I have run this curriculum past our advisors. their reply:
"Our BS students would have to take the majority (if not all) of these courses outside of their degree requirements (some may be able to use some of their general elective hours, but most of these are completed with math pre-reqs and learning community credits). The only one I could see counting is their PHL 3780: Bioethics (the dept could agree to accept this since we offer a similar course). Are many of the PHL courses offered in the summer? If so, I could see students complete the minor along with their major requirements still in 4 years.

Our BA students should be able to fit this in their program requirements nicely. The only downside is that we don't have that many BA students."

So: It seems like the program is good to go from our end. I will hope that we can encourage interest in it, it's a nice addition to our offerings.
-David

## B. Physics

Date: June 18, 2012
From: Lok Lew Yan Voon, Chair, Physics Department
To: Erik Banks
Re: History and Philosophy of Science Minor

Hi Erik,
Our BA (BS) students have 18 (15) CH of electives so the BS students will have to take an extra class and also have no further choice but I guess that might be acceptable.

Regards,
Lok

## C. Student Letters

October 10, 2011

## To Whom it May Concern:

Dr. Banks has asked me to comment on the idea of a proposed minor in Philosophy and Scientific methods. Let me do so by showing how it would have fit my educational plans.

I transferred to Wright State after my freshman year as a physics major with an interest in philosophy. The second philosophy course I took at Wright State was Dr. Banks' PHL 471 Philosophy of Physical Science, which opened my eyes as a science student. By the end of the quarter I had declared philosophy as a second major.

One reason for this was to set a goal to learn a sufficient amount of philosophy before I continued on my career in science. Another reason was because the philosophy minor had restrictions that made it difficult to satisfy. The history of philosophy courses were offered too sporadically and would conflict with my science and math courses, or the science philosophy class I wanted to take would not count towards the minor because it was in the research methods category that had already been satisfied. I would certainly have been benefited by having the option of a minor in philosophy and scientific methods.

Combining philosophy with science made me more competitive for graduate school. I was told during a summer internship by Eric Mazur, a Harvard University professor of physics and applied physics, that they look for applicants that can do more than physics. My immediate response was, "then I'm perfect." I explained to him that I was earning separate degrees in physics and philosophy, and also did music and art as a creative outlet. I am now a graduate student in applied physics at Harvard. Having a background in philosophy has strengthened my problem solving and critical thinking ability. It has helped my ability to think abstractly and creatively as well. All of these are very beneficial for scientists.

## Zach Gault

Wright State University Class of 2011

April 5, 2012

## To Whom it May Concern,

As a physics student at Wright State University, I am in full support of introducing the option of a minor in Philosophy of Science. Had this option been available in my undergrad, I would have taken full advantage of it.

Throughout the course of my undergraduate career I had taken a few philosophy courses where the concentration focused on areas like scientific revolutions, paradigms in classical physics, and relativity. Despite having taken physics classes where these same topics were covered, the physics classes tend to be more method driven and formulaic in nature. The discussion of the physical significance of problems is often skipped over entirely. Take for example, the theory of relativity. I was taught in my physics courses how to accurately calculate length contractions and time dilations for objects moving at near light speed, however these calculations give very little visualization of the scenario. This same topic was covered in a philosophy course (Prof. Banks' PHL 399 Space and Time) where we discussed the physical consequences, paradoxes, and problems of "which observation happened first?" when objects move at near light speeds.

In retrospect, my education on several topics in my physics courses was incomplete because they lacked the discussion and visualization that many of my philosophy courses provided. Only after having both aspects (the formulation and the physical visualization) presented that I feel I have begun to see the whole picture. A minor in Philosophy of Science provides a different way of looking at phenomena of which many scientists are already familiar, but have not really delved deeply into. It would also provide good training in learning how to think about phenomena beyond the formulas that represent them.

Sincerely yours,
Lindsay Marie Owens
Entering graduate school in physics, Rice University

November 30, 2011
To Whom it May Concern,
I am writing in support of Dr. Banks' proposal of a philosophy of science minor at Wright State University.
I believe that philosophy and science complement each other in a way that is often unknown to scientists like myself. The philosophy courses I took at Wright State greatly enriched my education. Science - its methods, its history, its impact society - I now view with a new set of eyes. I support the formation of this new minor, as I feel that many will benefit from what it has to offer. I'm just disappointed this option did not exist when I was a student.

Sincerely yours,
Leah Kershner
Wright State Honors Student and Currently Ph.D. student in Biology at Kent State University

## SOCIAL SCIENCE EDUCATION DEPARTMENTAL HONORS PROGRAM

The Honors Program in Social Science Education enables superior and highly motivated students to engage in an in-depth study of topics within SSE of interest to them and to develop their scholarly abilities in this interdisciplinary field of study.

1. To enter the honors program in SSE, a student must be a SSE major, be a junior or senior with at least 30 credit hours completed towards the SSE major, have a cumulative grade point average of 3.0 overall and 3.5 in the major, and apply to the Director of the SSE Program for admission no later than the beginning of their senior year. Students are advised to meet with the Director of SSE prior to submission of the application.
2. The application for admission must include a brief statement of eligibility and a 1-2 page summary of the proposed honors research paper, including a research question and bibliography. The paper should be approximately 20 pages long and interdisciplinary, although it should have a focus in either History or Political Science. The application must include the name of a faculty member in History or Political Science who has agreed to serve as the advisor for the paper. Once the application is approved, the student will be given permission to register for either PLS 4910 or HST 4950 which will substitute for a mandatory upper-level history or political science course.
3. Honors will be awarded if a letter grade of $A$ or $B$ is assigned by the advisor for PLS 4910 or HST 4950 and if, in addition, candidates for SSE Honors complete at least one University Honors Seminar (UH 4000). If a student fails to meet these grading and course requirements, s/he will not graduate with Honors in SSE, but can still count PLS 4910 or HST 4950 towards their major if completed with a grade of $C$.

Fall 2012

The Departmental Honors Scholar degree designation is awarded through the University Honors Program at Wright State University. For your convenience, this template reflects typical departmental honors requirements, and you may find that this template will help you to convert the existing quarter requirements to semester requirements.

|  | Semester Requirements |
| :---: | :---: |
| Eligibility Requirements <br> - Cumulative and/or major GPAs <br> - Earned credit hours | A Major in GER, FR, or SPN. Must be in the final year of studies. |
| Proposal and Approval Process <br> - Requirements for a student proposal <br> - Details about the department's approval of the proposal | A written proposal outlining the honors project, submitted to the project advisor (one faculty member) and the department Chair. GPA of 3.5 or better in the major. |
| Academic Requirements <br> - Length, scope, and nature of the research/project/internship/ co-op/performance <br> - Course(s), credit hours (typically 3-6 semester hours), and required grades <br> - Presentation (if required) | One semester honors course (GER/FR/SPN 4500) beyond requirements for the major. <br> At the end of the course, a substantial paper or project on a previously agreed topic; the paper will be written in the target language. If there is a project, a presentation (if applicable) may be required, by agreement with the advisor. |
| Evaluation <br> - Describe the criterion <br> - List who will determine satisfactory completion of the departmental honors requirements | The advisor, one additional faculty member, and the Chair will evaluate the paper. The Chair will verify that major requirements are also met. |
| Project Oversight <br> - Detail who will serve as a student's project advisor (a single faculty member, department committee, and/or department chair) | Single faculty member; the Chair will be available for consultation. |
| Timeline <br> - Describe the typical timeline for completion of the project, including milestones for when a student should apply to, begin work on, and complete the project | The student must apply the semester preceding that in which 4500 will be taken, and he/she must have the agreement of the faculty member before doing so. |
| Q2S Transition Plan <br> - If a student begins an honors project on the quarter system but will complete the project on the semester system, describe the transition plan, including Q2S course equivalencies | $N A$ |
| Forms <br> - Attach any forms a student must complete in conjunction with the departmental honors project (admission, approval, etc.) | Honors Project Form |

## Honors in Modern Languages

Name and Signature of Student:

UID of Student:

Name of Advisor:

Date of Request:

Semester and Year for the Honors Project:

Title of Honors Project:

Description of Honors Project (appr. 200 words):

## Approval

Date of Approval:

The Department of Computer Science and Engineering has requested termination of all of their computer science and computer engineering concentrations. The number of students in each of the concentrations is listed below.

## Undergraduate Concentrations to be Inactivated

|  | ¢ | ¢ |  |  | 0 0 0 0 0 0 |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Computer Engineering - BSCE | EG | UG | BSCE | Computer Engineering | Wireless | 6 | 3 |
| Computer Science - BSCS | EG | UG | BSCS | Computer Science | Bioinformatics | 1 |  |
| Computer Science - BSCS | EG | UG | BSCS | Computer Science | Business | 6 |  |
| Computer Science - BSCS | EG | UG | BSCS | Computer Science | Computational Science | 2 |  |
| Computer Science - BSCS | EG | UG | BSCS | Computer Science | Earth \& Environmental Sciences | 1 |  |
| Computer Science - BSCS | EG | UG | BSCS | Computer Science | Visualization | 1 |  |

The Department asks that (1) no new students be allowed to enter the concentrations listed below, (2) students currently enrolled in a concentration be allowed to finish their concentrations and (3) once all students enrolled in a concentration graduate or leave the program, allow the Registrar to terminate the concentration.

Program of Study (Inactivate) CS - Computer Science - BSCS / Bioinformatics<br>Program of Study (Inactivate) CS - Computer Science - BSCS / Computational Science<br>Program of Study (Inactivate) CS - Computer Science - BACS / Music<br>Program of Study (Inactivate) CS - Computer Science - BACS / Business<br>Program of Study (Inactivate) CS - Computer Science - BSCS / Visualization<br>Program of Study (Inactivate) CS - Computer Science - BSCS / Earth \& Environmental Sciences<br>Program of Study (Inactivate) CS - Computer Science - BSCS / Business<br>Program of Study (Inactivate) CS - Computer Science - BS IECS / Earth \& Environmental Sciences<br>Program of Study (Inactivate) CS - Computer Science - BS IECS / Computational Science<br>Program of Study (Inactivate) CS - Computer Science - BS IECS / Bioinformatics<br>Program of Study (Inactivate) CEG - Computer Engineering - IECS / Wireless<br>Program of Study (Inactivate) CEG - Computer Science - BSCS / Visualization<br>Program of Study (Inactivate) CEG - Computer Engineering - BSCE / Wireless

Date: August 2, 2012
To: Thomas Sudkamp, Interim Provost
From: Joanne Li, Dean, Raj Soin College of Business
Subject: RSCoB Department Name Change


I am writing this memo in support of the Department of Information Systems and Operations Management faculty's request to change the department name to the Department of Information Systems and Supply Chain Management.

The Management Science (MS) courses were modified to Supply Chain Management (SCM) courses in 2008-2009, approved by the university in March 2009 and implemented in fall 2009. The proposed name change will allow for a more effective alignment of operating functions and will encompass the names of the department's two majors.

This name change has my full support and I ask that you move this request through the necessary channels for approval.

Thank you.
JL/jw
Attachment


| To: | Joanne Li, Dean |
| :--- | :--- |
|  | Raj Soin College of Business |
| From: | Dwight Smith-Daniels, Chair and Professor <br>  <br>  <br>  <br>  <br>  <br>  <br> Oppartment of Information Systems and <br> Operations Management |
| Date: | August College of Business 2012 |
| Re: | Request to Change Department Name |

The Department of Information Systems and Operations Management faculty have deliberated on and passed to me a request for the department name to be changed to:

## Department of Information Systems and Supply Chain Management

## Rationale:

1. The proposed name change is a necessary branding adjustment in order that the department, in name as well as purpose, remains aligned with the vision and mission of both the university and college and specifically with regard to innovation and relevance:

WSU Vision: ..."Wright State will be Ohio's most innovative university" and WSU Strategic Plan, http://www.wright.edu/foundational-principles/vision-statement and "Objective D: Enhance the quantity and quality of dialogue with our various communities to ensure our academic relevance and distinctiveness" http://www.wright.edu/foundational-principles/strategic-plan

Raj Soin College of Business vision statement: "To be a premier business college that is a catalyst for progress, innovation and positive change in the business world." ...and values: "We are committed to..."a curriculum that meets the changing demands of the business community." http://www.wright.edu/business/about/mission.html
2. With regard to our desire to meet the "demands [read needs and expectations] of the business community":

In an ever-expanding globalization of the business community, "supply chain management" has become the preferred national and international term within the business community when speaking of manufacturing activities, transactions and operations business activities. Supply Chain Management, as defined by Council of Supply Chain Management Professionals (CSCMP): "Supply chain management encompasses the planning and management of all activities involved in sourcing and procurement, conversion, and all logistics management activities. Importantly, it also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third party service providers, and customers. In essence, supply chain management integrates supply and demand management within and across companies."
3. University process completion: Management Science (MS) to Supply Chain Management (SCM) course modifications were processed by the department in AY 2008-09, approved by the university
in March, 2009 and were implemented in fall quarter, 2009. It is reasonable that the department name be changed to include the names of the department's two majors.

Therefore, as department chair, I concur with the faculty's decision to change the department name. I respectfully request that you act in support of the decision of the ISOM Department faculty by sending to the Provost a letter of support together with this letter so that the ISOM faculty request for department name change can be moved forward for university review and approval.



Kinesiology and Health Activity Courses

| Current KNH courses | KNH A Term Courses | KNH B Term Courses |
| :---: | :---: | :---: |
| KNH1020 AerobicCond | KNH1020A AerobicCond | KNH1020B AerobicCond |
| KNH1040 ArmyFitTraining | KNH1040A ArmyFitTraining | KNH1040B ArmyFitTraining |
| KNH1060 Backpacking | KNH1060A Backpacking | KNH1060B Backpacking |
| KNH1080 Basketball | KNH1080A Basketball | KNH1080B Basketball |
| KNH1100 Bowling | KNH1100A Bowling | KNH1100B Bowling |
| KNH1120 Canoeing | KNH1120A Canoeing | KNH1120B Canoeing |
| KNH1140 DanceBallroom | KNH1140A DanceBallroom | KNH1140B DanceBallroom |
| KNH1160 DanceLatin | KNH1160A DanceLatin | KNH1160B DanceLatin |
| KNH1180 DanceSwing | KNH1180A DanceSwing | KNH1180B DanceSwing |
| KNH1200 FencingBeg | KNH1200A FencingBeg | KNH1200B FencingBeg |
| KNH1210 FencingInterm | KNH1210A FencingInterm | KNH1210B FencingInterm |
| KNH1220 FencingComp | KNH1220A FencingComp | KNH1220B FencingComp |
| KNH1240 Golf | KNH1240A Golf | KNH1240B Golf |
| KNH1260 H2O DeepCond | KNH1260A H2O DeepCond | KNH1260B H2O DeepCond |
| KNH1270 H2O Kickboxing | KNH1270A H2O Kickboxing | KNH1270B H2O Kickboxing |
| KNH1280 H2O Moves with Step | KNH1280A H2O Moves with Step | KNH1280B H2O Moves with Step |
| KNH1300 Hiking | KNH1300A Hiking | KNH1300B Hiking |
| KNH1340 Judo | KNH1340A Judo | KNH1340B Judo |
| KNH1360 Karate | KNH1360A Karate | KNH1360B Karate |
| KNH1380 Kayaking; Recreational | KNH1380A Kayaking; Recreational | KNH1380B Kayaking; Recreational |
| KNH1400 Lifeguard Training | KNH1400A Lifeguard Training | KNH1400B Lifeguard Training |
| KNH1420 Orienteering Land Navigation | KNH1420A Orienteering Land Navigation | KNH1420B Orienteering Land Navigation |
| KNH1440 Physical Education for Disabled | KNH1440A Physical Education for Disabled | KNH1440B Physical Education for Disabled |
| KNH1450 Rape Defense Basic | KNH1450A Rape Defense Basic | KNH1450B Rape Defense Basic |
| KNH1460 Rape Defense Intermediate | KNH1460A Rape Defense Intermediate | KNH1460B Rape Defense Intermediate |
| KNH1480 Rappelling | KNH1480A Rappelling | KNH1480B Rappelling |
| KNH1500 Scuba and Skin Open Water | KNH1500A Scuba and Skin Open Water | KNH1500B Scuba and Skin Open Water |
| KNH1510 Scuba Advanced Diver | KNH1510A Scuba Advanced Diver | KNH1510B Scuba Advanced Diver |
| KNH1520 Scuba Master Diver | KNH1520A Scuba Master Diver | KNH1520B Scuba Master Diver |
| KNH1530 Scuba Newport | KNH1530A Scuba Newport | KNH1530B Scuba Newport |
| KNH1540 Self Defense for Women | KNH1540A Self Defense for Women | KNH1540B Self Defense for Women |
| KNH1560 Soccer Indoor | KNH1560A Soccer Indoor | KNH1560B Soccer Indoor |
| KNH1560 Soccer Outdoor | KNH1560A Soccer Outdoor | KNH1560B Soccer Outdoor |
| KNH1600 Step Aerobics | KNH1600A Step Aerobics | KNH1600B Step Aerobics |
| KNH1610 Strength\&Tone | KNH1610A Strength\&Tone | KNH1610B Strength\&Tone |
| KNH1620 Strength\&TonePilates | KNH1620A Strength\&TonePilates | KNH1620B Strength\&TonePilates |
| KNH1660 Swimming Beg | KNH1660A Swimming Beg | KNH1660B Swimming Beg |
| KNH1670 Swimming Inter | KNH1670A Swimming Inter | KNH1670B Swimming Inter |
| KNH1680 Swimming Advance | KNH1680A Swimming Advance | KNH1680B Swimming Advance |
| KNH1700 Tai Chi | KNH1700A Tai Chi | KNH1700B Tai Chi |
| KNH1720 Tennis | KNH1720A Tennis | KNH1720B Tennis |
| KNH1740 Volleyball | KNH1740A Volleyball | KNH1740B Volleyball |
| KNH1760 Walk Jog Run | KNH1760A Walk Jog Run | KNH1760B Walk Jog Run |
| KNH1770 Water Safety Instruction | KNH1770A Water Safety Instruction | KNH1770B Water Safety Instruction |
| KNH1780 Weight Training | KNH1780A Weight Training | KNH1780B Weight Training |
| KNH1800 Weight Training Women | KNH1800A Weight Training Women | KNH1800B Weight Training Women |
| KNH1820 Winter Camping | KNH1820A Winter Camping | KNH1820B Winter Camping |
| KNH1960 Yoga | KNH1960A Yoga | KNH1960B Yoga |
| KNH1980 Zumba | KNH1980A Zumba | KNH1980B Zumba |
| KNH1990 BIPE Student | KNH1990A BIPE Student | KNH1990B BIPE Student |


| Course: |  |  | Course Number: |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| ENG | $\bigcirc$ EGR | $\bigcirc \mathrm{COM}$ |  | $\begin{aligned} & \text { (0)(0)(0)(0) } \\ & \text { (1)(1)(1)(1) } \\ & \text { (2)(2)(2)(2) } \\ & \text { (3)(3)(3)(3) } \\ & \text { (4)(4)(4)44) } \\ & \text { (5)(5)(5)(5) } \end{aligned}$ |  |  |
|  |  |  |  |  | The Wright State Core is an integrated program that provides students with the skills, knowledge, and understanding expected of university graduates. Each Element in the Wright State Core focuses on a specific set of learning outcomes. |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| Semester: |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | (6) (6)6(6) | Please blacken in all that apply to this course: |  |
| $\bigcirc$ Fall | () Spring |  |  | (7) (7) (7) 7 | Honors | Multicultural Competence |
|  |  |  |  | (8)8)888 | Integrated Writing | Service Learning |
|  |  |  |  | (9)(9)(9)(9) |  |  |

Courses in Element 1 help students develop foundational skills needed in academic discourse, research, and documentation in an electronic environment.

## Directions:

How do you think this course contributed to your achieving each learning outcome for Element 1? Darken the circle that best represents your response to each item. Thank you.

## This course improved my ability to:

| STRONGLY <br> AGREE | AGREE | DISAGREE | STRONGLY <br> DISAGREE <br> APLIICA |
| :---: | :---: | :---: | :---: |
| (A) | (A) | (D) | (D) |
| (A) | (A) | (D) | (D) |

2. Organize and produce text that are appropriate for specific genres,
$5 A$ (A) (D) (1) purposes, audiences, and stances.
3. Write using appropriate mechanics, usage, grammar, and spelling.
4. Find, analyze, and evaluate appropriate print and electronic source material.
5. Summarize and effectively incorporate appropriate source material.
6. Write focused, logical arguments that support a thesis.
7. Support claims with reliable and varied evidence.
8. Incorporate ideas from source material and acknowledge and document
the work of others appropriately.
9. Draft, revise, edit, and share text using electronic media.
(5) (A) (D) (5) (B)

Each Element of the Wright State Core should contribute to the development of the skills, knowledge, and understanding expected of university graduates, including critical thinking, creative problem solving, meaningful civic engagement, multicultural competence, appreciation of the arts, and lifelong learning. How do you think this course contributed to your achieving the overall learning outcomes of the Wright State Core?

## This course improved my ability to:

1. Communicate effectively.
2. Demonstrate mathematical literacy.
3. Evaluate arguments and evidence critically.
4. Apply the methods of inquiry of the natural sciences, social sciences, or the arts and humanities.
5. Demonstrate global and multicultural competence.
6. Demonstrate an understanding of comtemporary social or ethical issues.
7. Participate in democratic society as an informed and civically engaged citizen.
 AGREE

## (3)

(5)
( 8
(5)
urther comments about how this class meets the learning outcomes listed may be written on the back of this form.

# ELEMENT 

$\underset{\text { WRIGHT STATE }}{\text { IIITIEDID }}$
UNIVERSITY
The Wright State Core is an integrated program that provides students with the skills, knowledge, and understanding expected of university graduates. Each Element in the Wright State Core focuses on a specific set of learning outcomes.

Please blacken in all that apply to this course:
( 1 Honors
(1) Integrated Writing

Multicultural Competence
(5) Service Learning

Courses in Element 2 help students develop foundational skills required to use and interpret mathematics and statistics.

## Directions:

How do you think this course contributed to your achieving each learning outcome for Element 2? Darken the circle that best represents your response to each item. Thank you.

## This course improved my ability to:

STRONGLY AGREE DISAGREE STRONGLY NOT
AGREE
DISAGREE APPLICABLE

1. Identify and/or label various parts of a graph, equation, or relationship as it relates to a problem.
2. Find the values of variables, relationships or unknowns from a problem.
3. Apply an appropriate method to solve a real-world problem.
4. Interpret and draw conclusions from graphs, solutions of equations, or lists of (3) (A) (A) (D) (2) (B) (1) data.
5. Summarize and justify answers to problems, expressing solutions using an appropriate combination of words, symbols, tables or graphs.

Each Element of the Wright State Core should contribute to the development of the skills, knowledge, and understanding expected of university graduates, including critical thinking, creative problem solving, meaningful civic engagement, multicultural competence, appreciation of the arts, and lifelong learning. How do you think this course contributed to your achieving the overall learning outcomes of the Wright State Core?

## This course improved my ability to:



1. Communicate effectively.
2. Demonstrate mathematical literacy.
3. Evaluate arguments and evidence critically.
4. Apply the methods of inquiry of the natural sciences, social sciences, or


## GLOBAL TRADITIONS

| Course: |  |  | Course Number: |  |
| :---: | :---: | :---: | :---: | :---: |
|  | URS |  |  | (0)(0)(0) <br> (1)(1)(1)(1) <br> (2)(2)(2)(2) <br> (3)(3)(3)(3) <br> (4)(4)(4)(4) <br> (5)(5)(5)(5) |
| AFS | $\bigcirc \mathrm{CST}$ | URS |  |  |
| ATH | $\bigcirc \mathrm{EC}$ | CLS |  |  |
| $\bigcirc \mathrm{CS}$ | RST | HST |  |  |
|  |  |  |  |  |
| Semester: |  |  |  |  |
| (F) Fall | (5) Spring |  |  | (7) 7 (7) 7 |
|  |  |  |  | (8)88(8)8 |
|  |  |  |  | (9)(9)(9) |

## ॥ामझer <br> Wright State

 UNIVERSITYThe Wright State Core is an integrated program that provides students with the skills, knowledge, and understanding expected of university graduates. Each Element in the Wright State Core focuses on a specific set of learning outcomes.

Please blacken in all that apply to this course:
(H) Honors

Multicultural Competence
S) Service Learning

Courses in Element 3 help students develop foundational skills required to use and interpret mathematics and statistics.

## Directions:

How do you think this course contributed to your achieving each learning outcome for Element 3? Darken the circle that best represents your response to each item. Thank you.

## This course improved my ability to:

| STRONGLY AGREE DISAGREE |
| :--- |
| AGREE |


| STRONGLY NOT |
| :--- | :--- | :--- |
| DISAGREE APPLICABLE |


| SA | (A) | (D) |
| :--- | :--- | :--- |

2. Describe some of the historical, cultural, or spiritual traditions around the world.
3. Describe some of the technological innovations around the world.
4. Be aware of the diversity of people or traditions in our world in ways that
 promote effective engatement, both locally and globally.
5. Evaluate contemporary issues using political, social, or economic knowledge.
6. Evaluate contemporary issues using historical, cultural or spiritual knowledge.

| (A) |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
|  | (A) | (D) (D) (B) | (51) |  |
| (5) | D |  | (5) |  |

Each Element of the Wright State Core should contribute to the development of the skills, knowledge, and understanding expected of university graduates, including critical thinking, creative problem solving, meaningful civic engagement, multicultural competence, appreciation of the arts, and lifelong learning. How do you think this course contributed to your achieving the overall learning outcomes of the Wright State Core?

## This course improved my ability to:

STRONGLY AGREE DISAGREE STRONGLY NOT AGREE AGREE DISAGRE DISAGEE APPLICABL

1. Communicate effectively.
2. Demonstrate mathematical literacy.
3. Evaluate arguments and evidence critically.
4. Apply the methods of inquiry of the natural sciences, social sciences, or the arts and humanities.
5. Demonstrate global and multicultural competence.
6. Demonstrate an understanding of comtemporary social or ethical issues.
7. Participate in democratic society as an informed and civically engaged citizen.

Further comments about how this class meets the learning outcomes listed may be written on the back of this form.


## Directions:

How do you think this course contributed to your achieving each learning outcome for Element 4? Darken the circle that best represents your response to each item. Thank you.

This course improved my ability to:

1. Critically analyze significant creative, literary, philosophical, or religious works.
2. Understand and discuss the imaginative vision, socio-culture context,
 ethical values, and aesthetic judgment in the works studied in this course.
3. Recognize, evaluate, and respond to creative, philosophical, or religious work.
4. Apply knowledge of the humanities or the arts appropriately and ethically.
(a)
(A)
(D) (B)
(1)

Each Element of the Wright State Core should contribute to the development of the skills, knowledge, and understanding expected of university graduates, including critical thinking, creative problem solving, meaningful civic engagement, multicultural competence, appreciation of the arts, and lifelong learning. How do you think this course contributed to your achieving the overall learning outcomes of the Wright State Core?

This course improved my ability to:

1. Communicate effectively.
2. Demonstrate mathematical literacy.
3. Evaluate arguments and evidence critically.
4. Apply the methods of inquiry of the natural sciences, social sciences, or the arts and humanities.
5. Demonstrate global and multicultural competence.
6. Demonstrate an understanding of comtemporary social or ethical issues.
7. Participate in democratic society as an informed and civically engaged citizen.


| (BA) (A) | (D) | (2) | (IA |  |
| :--- | :--- | :--- | :--- | :--- |
| (B) | (A) | (D) | (2) | (1) |
| (5) | (A) | (D) | (1) | (1) |(1)

(5)
(5)
(A) (A)
(A) ) (D) (D)(1)

Further comments about how this class meets the learning outcomes listed may be written on the back of this form.


#### Abstract

The Wright State Core is an integrated program that provides students with the skills, knowledge, and understanding expected of university graduates. Each Element in the Wright State Core focuses on a specific set of learning outcomes.


Please blacken in all that apply to this course:
Honors
Multicultural Competence
Integrated Writing
Service Learning

Courses in Element 5 help students develop perspectives on human behavior and culture informed by the disciplines of the social sciences.

## Directions:

How do you think this course contributed to your achieving each learning outcome for Element 5? Darken the circle that best represents your response to each item. Thank you.

This course improved my ability to:

1. Critically apply social science theory and methods of inquiry to personal decisions, current issues, or global concerns.
2. Explain and evaluate appropriate use of social science methods.
STRONGLY AGREE DISAGREE STRONGLY NOT AGREE DISAGREE APPLICABL
3. Understand the ethical issues involved in aquiring and applying social science knowledge.
4. Understand the responsibilities of a citizen in a democratic society.
(5) (A)
(D)
(5)
(1)

Each Element of the Wright State Core should contribute to the development of the skills, knowledge, and understanding expected of university graduates, including critical thinking, creative problem solving, meaningful civic engagement, multicultural competence, appreciation of the arts, and lifelong learning. How do you think this course contributed to your achieving the overall learning outcomes of the Wright State Core?

This course improved my ability to:


1. Communicate effectively.
2. Demonstrate mathematical literacy.
3. Evaluate arguments and evidence critically.
4. Apply the methods of inquiry of the natural sciences, social sciences, or the arts and humanities.
5. Demonstrate global and multicultural competence.
6. Demonstrate an understanding of comtemporary social or ethical issues.
7. Participate in democratic society as an informed and civically engaged citizen.

Further comments about how this class meets the learning outcomes listed may be written on the back of this form.


## Directions:

How do you think this course contributed to your achieving each learning outcome for Element 6? Darken the circle that best represents your response to each item. Thank you.
STRONGLY AGREE DISAGREE STRONGLY NOT
AGREE
DISAGREE APPLICABLE

## This course improved my ability to:

1. Understand the nature of scientific inquiry.
2. Critically apply scientific theory and methods of inquiry to evaluate

(D) (5) (18) information from a variety of sources.
3. Distinguish between science and technology and recognize their roles in society.
4. Be aware of theoretical, practical, creative, and cultural dimensions of scientific inquiry.
5. Discuss fundamental theories underlying modern science $\qquad$ (A) (A) (A) (D) (5D) (11)

Each Element of the Wright State Core should contribute to the development of the skills, knowledge, and understanding expected of university graduates, including critical thinking, creative problem solving, meaningful civic engagement, multicultural competence, appreciation of the arts, and lifelong learning. How do you think this course contributed to your achieving the overall learning outcomes of the Wright State Core?

This course improved my ability to:
STRONGLY AGREE DISAGREE STRONGLY NOT
AGREE
DISAGREE APPLICABLE

1. Communicate effectively.
2. Demonstrate mathematical literacy.
3. Evaluate arguments and evidence critically.
4. Apply the methods of inquiry of the natural sciences, social sciences, or the arts and humanities.
5. Demonstrate global and multicultural competence.
6. Demonstrate an understanding of contemporary social or ethical issues.
7. Participate in democratic society as an informed and civically engaged citizen.


Further comments about how this class meets the learning outcomes listed may be written on the back of this form.

I have some information to share, and likely we will need a call to determine next steps. Here is the summary.

1 - Pre-requiste checking - the Wright State team is correct in that the configuration is system wide to flag prerequisite checking for either off, warning or stop with respect to registration. However, there are configuration options within the system to meet your business requirements for the graduate program, and at the student/course level. With using solid degree planning and building a roadmap toward degree completion that Degree Works offers, we can assist your advisors in being pro-active in ensuring students have the pre-reqs needed, if the institution decides to move forward with this solution.

Our recommendation is 6-8 hours of student consulting assistance to review requirements in detail and offer configuration options and support for testing. This can be done remotely, or in conjunction with other consulting support onsite.

2 - Fee Assessment/Billing - Banner can be configured with rules for fee assessment to meet the requirements that you mentioned. While the logic isn't straight forward to 'always charge the highest rate', based on the logic that you described, the rules can be written to provide the outcome in billing for tuition that is needed.

Our recommendation is 8 hours of student consulting assistance to review requirements in detail and offer configuration options and support for testing. This can be done remotely, or in conjunction with other consulting support onsite.

3 - Duplicate Class restriction - This is not as straight forward of a solution. Duplicate course checking can be overridden at the student / course level by and advisor or instructor, or there is another option to use different subject codes and course numbers, which we can assist with for the classes that this applies to , so that you can still have duplicate checking turned on for the labs, and other situations where this is important.

Our recommendation is 8 hours of student consulting assistance to review requirements in detail and offer configuration options and support for testing. This can be done remotely, or in conjunction with other consulting support onsite.

So, to accommodate all 3 requests, we can look at either remote assistance, or a week onsite to work with your team directly. If you would like to proceed, please let me know and I can work with you to coordinate next steps.

Thanks

Lori

## Lori Mauthe

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# College Readiness and Remediation Free 

 Standards Recommendations: Report to theProvosts and Chief Academic Officers of Ohio's Public Universities and Colleges

Recommendations of: Ohio College Readiness Advisory Committee

October 2012

## Table of Contents

Table of Contents ..... i
Ohio College Readiness Advisory Council ..... iv
Foreword ..... 1
Section I: Recommendations for College Readiness and Remediation-Free Guarantee ..... 2
General Principles ..... 3
The Remediation Free Guarantee ..... 3
Remediation-Free Guarantee Parameters ..... 3
Use of Multiple Measures ..... 3
Effective Models for Student Academic Support ..... 4
Recommendations for Further Work on Placement Policies and Practices ..... 4
Recommended Expectations for College Readiness in English Language Arts Literacies: ..... 5
Reading, Writing, Speaking, and Listening ..... 5
Recommended Assessments to Determine College Readiness / Remediation-Free Status in English Language Arts Literacies ..... 5
English Assessments for Placement into English Composition ..... 5
Reading Assessments for Placement into All First Level Transfer Credit-Bearing College Courses ..... 5
Recommended Expectations for College Readiness in Math and Science: ..... 6
Biology, Chemistry, Computer Science, Engineering, Geology, and Physics ..... 6
Recommended Assessments to Determine College Readiness / Remediation-Free Status in Math and Science. 6 ..... 6
English Assessments ..... 6
Reading Assessments ..... 6
Math Assessments ..... 6
Science Assessments for STEM Majors ..... 7
Assessing College Readiness in Cognitive and Non-Cognitive Skills ..... 8
Multiple-Measure Assessment Approach ..... 8
Assessing Non-Cognitive Skills ..... 8
Section II: Recommendations Beyond Scope of ORC Section 3345.061 (F) ..... 10
Policy and Practice Recommendations for Student Success ..... 11
Continuous Improvement Across the P-20 Continuum ..... 11
High School / Higher Education Alignment ..... 11
High School Assessments. ..... 11
Increasing College Knowledge among High School Students ..... 11
Placement Test Preparation ..... 12
Placement Task Force and Summit ..... 12
Appendix A. .....  A
Table of College Readiness Indicators .....  A

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## Foreword

House Bill 153 of the 129th Ohio General Assembly amended Section 3345.061 (F) of the Ohio Revised Code with the following:

Section 3345.061 (F) Not later than December 31, 2012, the presidents, or equivalent position, of all state institutions of higher education, or their designees, jointly shall establish uniform statewide standards in mathematics, science, reading, and writing each student enrolled in a state institution of higher education must meet to be considered in remediation-free status. The presidents also shall establish assessments, if they deem necessary, to determine if a student meets the standards adopted under this division. Each institution is responsible for assessing the needs of its enrolled students in the manner adopted by the presidents. The board of trustees or managing authority of each state institution of higher education shall adopt the remediation-free status standard, and any related assessments, into the institution's policies. The chancellor shall assist in coordinating the work of the presidents under this division.

To provide the chancellor's assistance of this work, the Academic Affairs Division of the Ohio Board of Regents invited faculty members from colleges and universities throughout Ohio to convene for the purposes of developing recommendations for:
1.) Uniform statewide standards in mathematics, science, reading, and writing; and
2.) Assessments to determine if a student meets the standards to be considered remediationfree.

The Ohio College Readiness Advisory Council (OCRAC) is grateful for the collective work of an English Language Arts panel, a Math and Science Panel, and the Ready for College subgroup of the Ohio Board of Regents Completion Task Force. These panels submitted their combined recommendations to OCRAC. Their recommendations are included as Appendix A in this report.

The report is organized as follows:

- Recommendations for College Readiness and Remediation-Free Guarantee
o Expectations for College Readiness in English Language Arts Literacies
o Assessments to Determine College Readiness/Remediation-Free Status in English Language Arts Literacies
o Expectations for College Readiness in Math and Science
o Assessments to Determine College Readiness / Remediation-Free Status in Math and Science
o Assessing Cognitive and Non-Cognitive Skills
- Recommendations Beyond Scope of ORC 3345.061(F)
o Policy and Practice Recommendations for Student Success


## Section I:

Recommendations for College Readiness and Remediation-Free Guarantee

## General Principles

## The Remediation Free Guarantee

In establishing college readiness expectations and assessment threshold scores to deem a student exempt from institutional placement testing for the purposes of remediation, the recommended expectations and related assessments included in this document provide a ceiling threshold that institutions may not exceed. It is recommended that institutions work with students and provide resources to support their successful attainment of first level college courses in specific disciplines.

It is strongly recommended that institutions design and implement placement procedures for students scoring below assessment threshold scores to further assess the student, utilizing multiple measures to determine the optimal plan to accelerate the student's enrollment in and successful completion of credit-bearing courses. Such measures could include review of high school grade point average, performance on new State assessments as they are adopted, particularly end-ofcourse assessments in high school, a writing assessment, a review of previous college work, and assessment of non-cognitive skills.

It is further recommended that aggregate assessment results be used to inform collaborative and continuous improvement efforts for both educator preparation programs and disciplinespecific content preparation provided by colleges of arts and sciences. It is further recommended that assessment results be used to inform secondary school curriculum and instruction to align high school and post-secondary student expectations and requirements for successful student transition. It is essential that high school curriculum and teaching practices be developed that better ensure that all students who earn a high school diploma are prepared for immediate entry into colleges or careers.

High schools should focus student coursework and support services to aid students in reaching the threshold expectations for college readiness in Ohio.

## Remediation-Free Guarantee Parameters

It is recommended that a student's demonstration of college readiness, as measured by her/his highest-scoring performance on an administration of an assessment exam be valid for two years from the completion of that assessment. After two years, institutions may require students to repeat an assessment to determine the currency of their college readiness.

## Use of Multiple Measures

It is strongly recommended that colleges and universities employ multiple assessment measures to determine optimal placement for student success. College and career readiness should include evaluation of key academic and non-academic risk factors. Effective placement procedures are those that consider high school performance, ACT scores (or its equivalent), previous college experience, and the essential inclusion of non-cognitive assessments where possible.

## Effective Models for Student Academic Support

It is strongly recommended that institutional policies and practices provide innovative models of remedial design, including supplemental instruction, co-enrollment in credit-bearing courses in other disciplines, enrollment in credit-bearing courses that are integrated with academic support services or employ innovative teaching practices, or refresher courses delivered in a module format, and other delivery methods that produce successful outcomes for students (Roderick, M., Nagaoka, J., Coca, V., 2009).

Recommendations for Further Work on Placement Policies and Practices
The complexity of college and university placement practices requires intentional, focused attention on developing and sustaining effective practices that optimize student success, support student persistence and accelerate time to degree and certificate completion. It is strongly recommended that the Chancellor and the leaders of Ohio's colleges and universities urgently pursue further work to establish consistency in the employment of effective placement practices at public universities and colleges throughout Ohio.

## Recommended Expectations for College Readiness in English Language Arts Literacies: Reading, Writing, Speaking, and Listening

The Ohio College Readiness Advisory Council recommends the Expectations forwarded by the English Language Arts Panel as detailed on pages 6 through 11 of Appendix B.

## Recommended Assessments to Determine College Readiness / Remediation-Free Status in English Language Arts Literacies

English Assessments for Placement into English Composition

| Assessment | Threshold Score* |
| :--- | :--- |
| ACT | 18 English Exam |
| SAT | 440 Writing |

Reading Assessments for Placement into All First Level Transfer Credit-Bearing College Courses

| Assessment | Threshold Score* |
| :--- | :--- |
| Enhanced ACT Reading Score | 21 |
| SAT Reading Score | 450 |

*Admitted students achieving or exceeding the English and Reading scores on this page are guaranteed exemption from placement into non-credit remedial courses on the basis of English Language Arts (ELA) literacies and are guaranteed exemption from requisite institutional placement testing for purposes of remedial placement based on ELA literacies.

It is emphasized that institutions are not required to place students scoring below the threshold score into remedial courses. Students scoring below the threshold score are subject to institutional placement procedures to gain eligibility to enroll in credit-bearing courses. Such procedures could include but not be limited to review of high school grade point average, a writing assessment, and a review of previous college work.

It is recommended that institutional policies provide for innovative, effective models of academic support for students scoring below the threshold scores, including supplemental instruction, co-enrollment in credit-bearing courses, and/or refresher courses delivered in a module format.

## Recommended Expectations for College Readiness in Math and Science:

Biology, Chemistry, Computer Science, Engineering, Geology, and Physics
The Ohio College Readiness Advisory Council recommends the Expectations forwarded by the Math/Science Panel as detailed on pages 12 through 28 of Appendix B.

## Recommended Assessments <br> to Determine College Readiness / Remediation-Free Status in Math and Science

Of note, the threshold Math ACT score included in these recommendations differs from the Math/Science panel recommendation of an ACT Math threshold score of 24. OCRAC discussed the wide range of credit-bearing Math courses that meet program and degree requirements for students who do not major in Science/Technology/Engineering/Math/Medicine (STEMM) programs. OCRAC recommends a Math ACT threshold score of 22, and strongly recommends that further statewide work on placement practices examine the need for differentiated Math threshold scores for STEMM and non-STEMM majors.

OCRAC's recommendation of an ACT math score threshold of 22 signals the need for institutions to design and offer non-remedial general education mathematics or other quantitative and logical analysis courses that meet degree program requirements. Such courses could include liberal arts math, contemporary math, logic or quantitative reasoning, technical or applied math, finite math, or elementary statistics among others.

English Assessments

| Assessment | Threshold Score* |
| :--- | :--- |
| ACT | 18 English Exam |
| SAT | 430 Writing |
|  | 450 Critical Reading |

## Reading Assessments

| Assessment | Threshold Score* |
| :--- | :--- |
| Enhanced ACT Reading Score | 21 |
| SAT Reading Score | 450 |

Math Assessments

| Assessment | Threshold Score* |
| :--- | :--- |
| ACT Math Sub-Score | 22 |
| SAT Math Score | 520 |

*Admitted students achieving or exceeding these scores are guaranteed exemption from placement into non-credit remedial courses and are guaranteed exemption from requisite institutional placement testing for purposes of remedial placement.

It is emphasized that institutions are not required to place students scoring below the statewide threshold score into remedial courses. Students scoring below the threshold score are subject to institutional placement procedures to gain eligibility to enroll in credit-bearing courses. Such procedures should include review of high school grade point average and other assessments, and a review of previous college work.

Science Assessments for STEM Majors
To assess a prospective STEM major's preparedness for success in college level courses, it is important to assess their math abilities, reading comprehension, and science reasoning skills. The Math and Science Panel does not recommend setting a threshold score for the ACT Science exam, as the focus of this assessment is on science reasoning and not science content, thereby making the assessment redundant to the reading comprehension assessment.

For STEM majors, there is significant advantage in mastering some core chemistry content to be considered ready for the first college level chemistry courses. To determine whether students are ready for success in college level science courses for majors, an assessment is needed to determine if they have mastered the science content; however, such an assessment that is appropriate, readily available for use at the high school level, and affordable is not currently available. The Ohio Department of Education plans to institute end-of-course assessments for Physical Science and Biology high school courses to be administered in 2014-15 and will likely develop end-of-course assessments for Chemistry and Physics courses subsequently. The Math and Science Panel recommends that these end-of-course assessments be adopted as indicators as soon as they are available.

Until better assessments of science content knowledge are available, the Math and Science Panel recommends that campuses be allowed to use their own assessments of science content to supplement the other sources of information such as ACT scores, high school grade point average (GPA), and other indicators of college readiness in determining the college readiness in science for STEM majors.

## Assessing College Readiness in Cognitive and Non-Cognitive Skills

In addition to mastery of content knowledge, to be college ready in the 21st century, students must demonstrate mastery of cognitive learning strategies, responsibility for their own learning, time management, study skills and habits, critical thinking abilities and non-cognitive skills required for postsecondary success. Mastery of these skills is included as a key part of a multifaceted college readiness definition for Ohio students.

It is recommended that colleges and universities administer authentic assessments of college readiness in order to ensure students are best positioned for success when beginning their postsecondary experiences. Authentic assessments confront students with the kinds of problems they will encounter as college students and subsequently as professionals and engaged citizens. In authentic assessments, students are required to draw upon a wide variety of skills, accessing and drawing meaning from multiple information sources to develop cogent responses (Austin, 2010) ${ }^{1}$. Authentic assessments must be based on a multi-faceted definition of college readiness, and if used effectively, can help reform the placement process in colleges and universities.

## Multiple-Measure Assessment Approach

College and work readiness in math, reading, and writing must be determined through the use of multiple-measure assessment approaches that include evaluation of key academic and nonacademic risk factors. Effective placement relies on effective assessment of student learning and performance on tasks directly related to the tasks students will be doing in the courses into which they are placed. Effective assessment practices must consider multiple measures, including but not limited to high school performance, ACT scores, previous college experience, and non-cognitive assessments.

## Assessing Non-Cognitive Skills

Non-cognitive skills include a range of behaviors that reflect greater student self-awareness, self-monitoring, and self-control-study skills, work habits, time management, help-seeking behavior, and social problem-solving skills. Meeting the developmental demands of college requires behavioral, problem-solving, and coping skills that allow students to successfully manage new environments and the new academic and social demands of college ${ }^{2}$.

It is strongly recommended that institutions implement authentic assessments of students' non-cognitive skills among the multiple measures employed to determine optimal placement and support measures for student persistence and success. While the results of assessment of noncognitive skills should not place a student into remedial coursework, they should be used to inform

[^1]individualized planning for targeted support and resources to strengthen identified skills requiring strengthening.

Available assessments of non-cognitive skills include the Noel-Levitz College Student Inventory (CSI) and integrated assessment, and the Grit-S Assessment (Duckworth, A., \& Quinn, P., 2009). Duckworth, Peterson, Matthews, and Kelly (2007) introduced the construct of grit, defined as traitlevel perseverance and passion for long-term goals, and showed that grit predicted achievement in challenging domains over and beyond measures of talent.

In addition to non-cognitive assessments, a number of advising software packages are available to support individualized academic planning to support persistence and completion.

## Section II: Recommendations Beyond Scope of ORC Section 3345.061 (F)

## Policy and Practice Recommendations for Student Success

## Continuous Improvement Across the P-20 Continuum

Postsecondary institutions in Ohio prepare the majority of educators for the state's elementary and secondary schools. Given the importance of this role in the P-20 continuum, it is strongly recommended that aggregate student assessment results be used to inform collaborative and continuous improvement efforts for both educator preparation programs and discipline-specific content preparation provided by colleges of arts and sciences. It is further recommended that assessment results be used to inform secondary school curriculum and instruction to align high school and post-secondary student expectations and requirements for successful student transition.

## High School / Higher Education Alignment

It is recommended that postsecondary institutions and secondary schools adopt and implement policies and practices that encourage and support collaboration between postsecondary faculty and high school faculty to assure alignment of the expectations for students moving from secondary to post-secondary education. A shared understanding of the content taught and skills developed at each educational level will support educator efforts to support students in a successful transition to and through the next level of learning.

It is recommended that the summer writing workshops bringing together high school and postsecondary writing faculty be reinstituted.

## High School Assessments

It is recommended that the state implement common end-of-course and end-of-year assessments to measure student mastery of course outcomes and preparation for college and that the assessment outcomes be utilized to inform educational plans for high school students as they prepare for college and careers. These individualized plans should include course selection and sequencing, supplemental instruction, and academic major/career exploration.

It is recommended that the Early Math Placement Test be reinstituted for all Ohio students.

## Increasing College Knowledge among High School Students

Sociological researchers emphasize that in addition to measured qualifications, a student's college readiness will be shaped by whether he or she has the information, resources, and skills necessary to effectively navigate the college admission process-college knowledge. College knowledge may contribute to significant disparities in college readiness by income and race and ethnicity, with low-income and minority students facing barriers to college access beyond their qualifications and point to the importance of understanding the college application process, the financial aid system, and the range of choices within the postsecondary system, as well as being able to navigate these complex processes and systems. Successfully enrolling in college requires
such knowledge, which high schools can support by providing norms, information, and guidance about college to their students (Roderick, M., Nagaoka, J., Coca, V., 2009). ${ }^{3}$

It is recommended that high schools and postsecondary institutions collaborate to provide college information to students beginning in the middle grades, and sustaining the effort throughout the high school years. It is recommended that these strategies engage parents and guardians in the communication efforts.

It is recommended that the Chancellor lead an effort to develop information resources that identify preparation pathways for academic majors that identify requisite content mastery for specific majors, including the academic foundations required for STEMM majors.

## Placement Test Preparation

It is recommended that postsecondary institutions that employ placement exams implement mandatory preparation experiences for placement testing. The preparation sessions should consist of orientation-to-the-test information and a review of math concepts involved in the tests prior to placement testing.

## Placement Task Force and Summit

The recommendations contained within this report constitute expectations and assessment ceiling thresholds for a statewide remediation-free guarantee for students. Beyond a remediationfree guarantee, there is a need for an improved statewide placement policy for postsecondary institutions in Ohio. Currently (2012), placement policies throughout the state are widely varied due to the variety of institutional missions across the state.

It is recommended that the Chancellor convene a Placement Task Force to research placement practices across Ohio. It is further recommended that the Placement Task Force coordinate a statewide placement summit to establish consistency among the placement policies and practices in Ohio's public colleges and universities that reflects the range of student needs and goals while supporting each institution's unique mission.

It is recommended that statutory language be developed as needed to assure adherence to the established policies and practices.

It is recommended that the Chancellor lead an effort to develop information resources that identify preparation pathways for academic majors that identify requisite content mastery for specific majors, including the academic foundations required for STEMM majors.

[^2]
## Appendix A

## Table of College Readiness Indicators

| Readiness Area |  | SAT |
| :--- | :---: | :---: |
| English Sub Score | 18 or Higher | Writing 430 or Higher |
|  |  | Critical Reading 450 or Higher |
| Reading Sub Score | 21 or Higher | 450 or Higher |
| Mathematics Sub Score | 22 or Higher | 520 or Higher |

## Appendix B:

# College Readiness and Remediation Free Standards Recommendations: Report to the Ohio College Readiness Advisory Committee 

Composite Recommendations of:
English Language Arts Faculty Panel
Math / Science Faculty Panel
Ready for College Subgroup of Ohio Board of Regents Completion Task Force

## Table of Contents

Table of Contents ..... i
English Language Arts Panel Members ..... iii
Math / Science Panel Members ..... iv
Ready for College Subgroup of the Ohio Board of Regents College Completion Task Force. ..... vi
Foreword ..... vii
Section I: Recommendations for College Readiness and Remediation-Free Guarantee ..... 1
General Principles ..... 2
The Remediation Free Guarantee ..... 2
Remediation-Free Guarantee Parameters ..... 2
Use of Multiple Measures ..... 2
Effective Models for Student Academic Support ..... 3
Recommended Expectations for College Readiness in English Language Arts Literacies: ..... 4
Reading, Writing, Speaking, and Listening ..... 4
Reading ..... 4
Key Ideas and Details ..... 4
Craft and Structure ..... 5
Integration of Knowledge and Ideas ..... 5
Range of Reading and Level of Text Complexity ..... 6
Writing ..... 6
Text Types and Purposes ..... 6
Production and Distribution of Writing ..... 6
Research to Build and Present Knowledge. ..... 7
Speaking, Viewing and Listening ..... 7
Comprehension and Collaboration ..... 7
Presentation of Knowledge and Ideas ..... 8
Recommended Assessments to Determine College Readiness / Remediation-Free Status in English Language Arts Literacies ..... 10
English Assessments for Placement into English Composition ..... 10
Reading Assessments for Placement into All First Level Transfer Credit-Bearing College Courses 10
Recommended Expectations for College Readiness in Math and Science: ..... 12
Biology, Chemistry, Computer Science, Engineering, Geology, and Physics ..... 12
College-Level Learning Skills Required for All Students ..... 13
Science Content Knowledge and Science and Mathematics Skills Needed by Students Who Will Only Enroll in General Education Natural Science Courses for Non-Science Majors ..... 14
Science Content Knowledge ..... 14
Science Mathematics Skills ..... 15
Rationale ..... 15
Science Content Knowledge and Science and Mathematics Skills Needed by Students Who Will Take Natural Science Courses Intended for Those Majoring in the Natural and Health Sciences ..... 16
An Additional Recommendation for Students Planning to Major in a Field of Engineering ..... 17
Recommended Mathematical Expectations for College Readiness 2011 ..... 18
Expectation 1: Mathematical Processes ..... 19
Expectation 2: Number and Operations ..... 20
Expectation 3: Algebra ..... 21
Expectation 4: Geometry ..... 23
Expectation 5: Probability and Statistics ..... 25
Additional Expectations for Calculus ..... 25
Recommended Assessments to Determine College Readiness / Remediation-Free Status in Math and Science ..... 29
English Assessments ..... 29
Reading Assessments ..... 30
Math Assessments ..... 30
Science Assessments for STEM Majors ..... 31
Assessing College Readiness in Cognitive and Non-Cognitive Skills ..... 32
Multiple-Measure Assessment Approach ..... 32
Assessing Non-Cognitive Skills ..... 32
Section II: Recommendations Beyond Scope of ORC Section 3345.061 (F) ..... 34
Policy and Practice Recommendations for Student Success ..... 35
Continuous Improvement Across the P-20 Continuum ..... 35
High School / Higher Education Alignment ..... 35
High School Assessments ..... 35
Increasing College Knowledge among High School Students ..... 35
Placement Test Preparation ..... 36
Placement Summit ..... 36

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## Foreword

House Bill 153 of the 129th Ohio General Assembly amended Section 3345.061 (F) of the Ohio Revised Code with the following:

Section 3345.061 (F) Not later than December 31, 2012, the presidents, or equivalent position, of all state institutions of higher education, or their designees, jointly shall establish uniform statewide standards in mathematics, science, reading, and writing each student enrolled in a state institution of higher education must meet to be considered in remediation-free status. The presidents also shall establish assessments, if they deem necessary, to determine if a student meets the standards adopted under this division. Each institution is responsible for assessing the needs of its enrolled students in the manner adopted by the presidents. The board of trustees or managing authority of each state institution of higher education shall adopt the remediation-free status standard, and any related assessments, into the institution's policies. The chancellor shall assist in coordinating the work of the presidents under this division.

To provide the chancellor's assistance of this work, the Academic Affairs Division of the Ohio Board of Regents invited faculty members from colleges and universities throughout Ohio to convene for the purposes of developing recommendations for:
1.) Uniform statewide standards in mathematics, science, reading, and writing; and
2.) Assessments to determine if a student meets the standards to be considered remediationfree.

The recommendations included in this report reflect the collaborative work of an English Language Arts panel, a Math and Science Panel, and the Ready for College subgroup of the Ohio Board of Regents Completion Task Force. The content area panels were each comprised of higher education and secondary faculty members from public and private institutions throughout Ohio. The Ready for College subgroup was comprised of postsecondary faculty from public two- and fouryear institutions throughout Ohio.

The content panels analyzed data reflecting the historical performance of Ohio students in noncredit remedial college coursework and first level credit bearing coursework. Panel members gathered information on current placement practices of higher education institutions in Ohio and the perceived effectiveness of those practices. In addition, panel members performed a review of the existing body of research on effective placement practices.

The Ready for College subgroup analyzed best practices throughout Ohio and the United States in developing its recommendations.

The report is organized as follows:

- Recommendations for College Readiness and Remediation-Free Guarantee
o Expectations for College Readiness in English Language Arts Literacies
o Assessment to Determine College Readiness/Remediation-Free Status in English Language Arts Literacies
o Expectations for College Readiness in Math and Science
o Assessment to Determine College Readiness / Remediation-Free Status in Math and Science
o Assessing Cognitive and Non-Cognitive Skills
- Recommendations Beyond Scope of ORC 3345.061(F)
o Policy and Practice Recommendations for Student Success


## Section I:

## Recommendations for College Readiness and Remediation-Free Guarantee

## General Principles

## The Remediation Free Guarantee

In establishing college readiness expectations and assessment threshold scores to deem a student exempt from institutional placement testing for the purposes of remediation, the recommended expectations and related assessments included in this document provide a threshold that institutions may not exceed. While institutions are allowed to set assessment threshold scores lower than the measures detailed in this document, they are not allowed to set assessment threshold scores higher than the recommendations herein. Further, a student who achieves a score lower than the threshold score need not be placed automatically into remediation. It is strongly recommended that institutions design and implement placement procedures for students scoring below assessment threshold scores to further assess the student, utilizing multiple measures to determine the optimal plan to accelerate the student's enrollment in and successful completion of credit-bearing courses. Such measures could include review of high school grade point average, performance on new State assessments as they are adopted, particularly end-ofcourse assessments in high school, a writing assessment, a review of previous college work, and assessment of non-cognitive skills.

It is further recommended that aggregate assessment results be used to inform collaborative and continuous improvement efforts for both educator preparation programs and disciplinespecific content preparation provided by colleges of arts and sciences. It is further recommended that assessment results be used to inform secondary school curriculum and instruction to align high school and post-secondary student expectations and requirements for successful student transition. It is essential that high school curriculum and teaching practices be developed that better ensure that all students who earn a high school diploma are prepared for immediate entry into colleges or careers.

## Remediation-Free Guarantee Parameters

It is recommended that a student's demonstration of college readiness, as measured by her/his highest-scoring performance on an administration of an assessment exam be valid for two years from the completion of that assessment. After two years, institutions may require students to repeat an assessment to determine the currency of their college readiness.

Use of Multiple Measures
It is strongly recommended that colleges and universities employ multiple assessment measures to determine optimal placement for student success. College and career readiness should
include evaluation of key academic and non-academic risk factors. Effective placement procedures are those that consider high school performance, ACT scores, previous college experience, and the essential inclusion of non-cognitive assessments.

## Effective Models for Student Academic Support

It is strongly recommended that institutional policies and practices provide innovative models of remedial design. Such models should include but not limited to supplemental instruction, coenrollment in credit-bearing courses in other disciplines, enrollment in credit-bearing courses integrated with academic support services or that employ innovative teaching practices, refresher courses delivered in a module format, and other delivery methods that produce successful outcomes for students (Roderick, M., Nagaoka, J., Coca, V., 2009).

## Recommended Expectations for College Readiness in English Language Arts Literacies:

## Reading, Writing, Speaking, and Listening

To prepare for post-secondary education and the world of work, students must be given opportunities to become competent communicators and critical thinkers. Students need to integrate reading, writing, speaking, viewing, listening, and applying technology creatively in a variety of contexts on a regular basis. Learning in the English language arts is an active and ongoing process and should occur throughout the curriculum-at all levels and in all subject areasand beyond the classroom setting. In short, success in post-secondary education and in the workplace entails both preparation in and ability in all of the areas noted in the recommendations.

The College Readiness Expectations in English provide a statement of the knowledge and skills that enable students to succeed in making the transition directly into first year, college-level, nonremedial courses. Representatives from higher education and secondary education reviewed these standards in April 2011 and found general alignment with the Common Core State Standards.

## Reading

## Key Ideas and Details

A. Understand that reading is a strategic process of constructing meaning from texts.
B. Actively engage texts, autonomously applying skills and strategies that are appropriate for the demands of the texts and their purposes for reading.
C. Formulate and clearly express complex ideas related to texts, citing evidence to support inferences and interpretations.
D. Think critically and creatively about the texts they read, often drawing upon their personal experiences and knowledge to enhance comprehension.
E. Analyze and interpret fiction and non-fiction texts (including expository and persuasive essays) and work-related documents such as manuals, memos, letters, and business plans.
F. Determine and comprehend the central themes of a text and analyze their development. Summarize the key supporting details and ideas.
G. Analyze how and why individuals, events, and ideas develop and interact over the course of a text.
H. Analyze how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take.
I. Cite textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.
J. Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem.

## Craft and Structure

A. Employ pre-reading strategies to identify features of text that aid comprehension (e.g., informational).
K. Understand and use text formatting features (table of contents, glossaries, navigation bars) to effectively locate and acquire information in a variety of texts.
L. Differentiate between fact and opinion.
M. Employ vocabulary-building strategies while reading various texts.
N. Evaluate an author's purpose and point of view by analyzing the use of language, style, and point of view found in the text.
0. Demonstrate an understanding that the writer's choice of language shapes meaning.
P. Evaluate an author's rhetorical and argumentative strategies.
Q. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.
R. Analyze the structure of texts, including how specific sentences, paragraphs, and larger portions of the text (e.g., a section, chapter, scene, or stanza) relate to each other and the whole.

## Integration of Knowledge and Ideas

A. Read and respond orally and in writing to texts representing a variety of genres, authors, cultures, and historical periods.
S. Establish and apply criteria for selecting and evaluating the credibility of print and multimodal texts for a range of purposes, including research.
T. Use features, (e.g., pie charts, bar graphs, pictures) to enhance, emphasize, and clarify comprehension of print, and multimodal, or oral texts across the curriculum.

## Range of Reading and Level of Text Complexity

A. Actively engage texts, autonomously applying skills and strategies that are appropriate for the demands of the texts and their purposes for reading.
B. Skillfully read a wide range of increasingly complex texts, print and multimodal.

## Writing

## Text Types and Purposes

A. Independently and ethically produce writing that meets the needs of a particular purpose and audience, appropriate for academic and work-related documents.
B. Select from a repertoire of processes and modes to develop writing for purposes such as persuasion, explanation, research, or personal expression.
C. Use style, voice and organizational structures which are transparent and appropriate for the rhetorical purpose and audience.
D. Adept at responding in writing to diverse texts and formats, synthesizing, critiquing and analyzing those texts.
E. Adapt writing strategies for audience, purpose, and type of task.
F. Produce texts that convey an argument that is organized, coherent, fully developed, and rhetorically appropriate in support of a thesis.
G. Produce writing that exhibits word choices that convey intended meaning.

## Production and Distribution of Writing

A. Independently and ethically produce writing that meets the needs of a particular purpose and audience, appropriate for academic and work-related documents.
B. Draft, revise, and edit writing autonomously.
C. Adapt writing strategies for audience, purpose, and type of task.
D. Use reflective strategies for critiquing and evaluating their own and others' writing.
E. Employ sentences of varying lengths and structures which are as appropriate to audience, purpose, and context.
F. Use appropriate conventions of the English language, including grammar and usage, punctuation, capitalization, and spelling.

## Research to Build and Present Knowledge

A. Employ the research writing skills of evaluating sources and integrating them in support of a thesis.
B. Accurately and correctly quote, paraphrase, and summarize material from another text to avoid unintentional plagiarism.
C. Properly cite sources, using a generally accepted citation system such as MLA or APA.

## Speaking, Viewing and Listening

## Comprehension and Collaboration

A. Listen actively and speak effectively in a variety of academic and work-related situations.
B. Listen carefully, take notes as needed, and not interrupt other speakers when engaged in group or committee work.
C. Deliver a clearly organized message when contributing to the group or committee work.
D. Take notes while listening to lectures or participating in other forms of information gathering and uses the notes to review and reflect on learning.
E. Know how to identify and accommodate cultural differences in communication styles and strategies.
F. Analyze and synthesize information gathered from a variety of sources.
C. Summarize information heard into another form of communication, e.g., rephrase statements, summarize a speech, and paraphrase an oral reading.
D. Evaluate and respond to a speaker's message.
E. Use viewing skills and strategies to understand and interpret visual media.
F. Support and clarify written and oral presentations with visual media resources, including electronic technologies.
G. Recognize and respect cultural and language differences in both formal and informal speaking situations.
H. Interpret and evaluate a speaker's rhetorical strategies and evidence.
I. Employ appropriate non-verbal strategies to enhance communication.
J. Summarize information heard into another form of communication, rephrase statements, summarize a speech, or paraphrase an oral reading.
K. Understand the impact that visual media has on society.
L. Set criteria and evaluate the technology techniques used to influence economic, political, cultural, social, and aesthetic decision-making.

## Presentation of Knowledge and Ideas

A. Present successfully to an audience, recognizing the needs of an audience for visual as well as auditory messages.
B. Deliver a clearly organized message when contributing to the group or committee work.
C. Speak fluently, enunciating clearly with appropriate rate and volume.
D. Speak effectively and listen actively in diverse communicative contexts.
E. Express ideas, thoughts, and concerns effectively in both formal and informal speaking situations, e.g., conversations, discussion, presentations, collaborative groups, one-onone interactions, debates, negotiations, and interviews.
F. Employ appropriate non-verbal strategies to enhance communication.
G. Recognize and evaluate techniques used in visual media to influence opinions, decisionmaking, and cultural perceptions.
H. Use images to convey meaning, often in conjunction with written or oral presentations.
I. Use visual media or computer technology to communicate effectively with a variety of audiences for a variety of purposes.
J. Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest.

## Recommended Assessments to Determine College Readiness / Remediation-Free Status in English Language Arts Literacies

## English Assessments for Placement into English Composition

| Assessment | Threshold Score* |
| :--- | :--- |
| ACT | 18 English Exam |
| SAT | 430 Writing Sub Score |
|  | 450 Critical Reading Sub Score |
| ACCUPLACER | 88 English; 70 Sentence Skills |

The COMPASS and ASSET English Exams are not recommended to assess student writing skills. These exams solely measures editing and reading comprehension skills and do not assess collegeready writing skills. Research has shown that the COMPASS English Exam has minimal predictive validity in placing students for success in English Composition (Hughes, K., Scott-Clayton, 2011). ${ }^{1}$ It is recommended that institutions administer an authentic writing assessment to determine optimal placement for student success.

Reading Assessments for Placement into All First Level Transfer Credit-Bearing College Courses

| Assessment | Threshold Score* |
| :--- | :--- |
| Enhanced ACT Reading Score | 21 |
| COMPASS | 87 |
| SAT Reading Score | 450 |
| ACCUPLACER Reading Scale Score ${ }^{2}$ | 102 |
| ASSET Reading Skills Score | 45 |

*Admitted students achieving or exceeding the English and Reading scores on this page are guaranteed exemption from placement into non-credit remedial courses on the basis of English Language Arts (ELA) literacies and are guaranteed exemption from requisite institutional placement testing for purposes of remedial placement based on ELA literacies.

[^3]It is critical to understand that institutions are not required to place students scoring below the threshold score into remedial courses. Students scoring below the threshold score are subject to institutional placement procedures to gain eligibility to enroll in credit-bearing courses. Such procedures could include review of high school grade point average, a writing assessment, and a review of previous college work.

It is recommended that institutional policies provide innovative, effective models of academic support for students scoring below the threshold scores, including supplemental instruction, coenrollment in credit-bearing courses, and/or refresher courses delivered in a module format.

## Recommended Expectations for College Readiness in Math and Science:

## Biology, Chemistry, Computer Science, Engineering, Geology, and Physics

College students in Ohio pursue a large and diverse range of academic majors related to the sciences and mathematics. Attempting to specify recommendations for each of these majors would be an extremely difficult task, particularly since the requirements for majors vary among the higher education institutions in the State. So instead, the faculty panel has developed recommendations for each of the common introductory courses in the natural sciences: biology, chemistry, physics, and geology. Recommendations are also provided for computer science and for engineering. Although these recommendations were not required by this legislation, the panel believes that these recommendations will be helpful for students, parents, teachers, and other stakeholders for advising students about how to prepare for these other closely related fields. Guidance counselors, academic advisors, and teachers can use these recommendations to advise students how to best prepare for college by determining which college courses they will likely need to complete based on the student's intended academic major in college.

The recommendations are divided into three sections: 1) Recommendations regarding learning skills needed by all students; 2) Recommendations regarding knowledge and skills needed by students who plan to only take general education science courses that are not intended for science majors; 3) Recommendations regarding knowledge and skills needed by students who plan to take science courses that are designed for students majoring in the natural and health sciences.

These recommendations are based, in part, on the Ohio College Ready Standards for Science that have been developed by the Ohio Department of Education, and also on the Mathematical Expectations for College Readiness 2011 developed by the Ohio Board of Regents with mathematics faculty.

The Ohio College Ready Standards specify what K-12 students in Ohio are expected to know and be able to do in each of the grade levels from Kindergarten through grade 8 and provide syllabi and model curricula for six high school science courses: the two required courses, biology and physical science, and four advanced courses: chemistry, physics, environmental science, and physical geology. These standards specify certain science facts, concepts, and relationships that students need to know, but also emphasize the importance of students achieving an understanding and mastery of the process and practice of science. It is notable that the list of facts, concepts, and relationships that students are expected to master in these standards is shorter than in the previous Ohio science standards. A feature of the revised standards that the panel considers valuable is their clear and explicit description of the depth of understanding that students are
expected to achieve for the high school curriculum topics. This will be a useful tool in efforts to establish more uniform high school instruction throughout the state so that all students are provided a level of instruction that will enable them to be well prepared for college level study in the natural sciences.

Indeed, the faculty panel strongly recommends that measures are enacted to ensure that all schools offer the quality and level of instruction to make it possible for all students to meet these expectations. Those measures would include a system of assessment, accountability, and resource allocation that ensures that coursework is sufficiently rigorous, thorough, and supportive, and teaching is of sufficient quality to meet all students' learning needs. The Ohio College Ready Standards (now known as the "Ohio New Learning Standards: K-12 Science"). provide a strong foundation on which to base those measures.

The recommendations in this document include a set of learning skills that the panel considers essential for success in college level coursework. Many students are currently enrolling in college science courses lacking these skills and they are at a severe disadvantage for success. For students to uniformly be able to succeed at the college level and meet expectations, it is essential that they have these important and essential skills.

The panel's recommendations build on the Mathematical Expectations for College Readiness 2011 which provides a well-organized, concise, yet thorough description of the mathematics knowledge and skills that students need to be prepared for college. The faculty panel is aware that it is possible for students to understand and to be able to demonstrate abstract math skills without being able to apply those within the scientific disciplines. Thus, the faculty panel indicates that it is not only sufficient for students to master the mathematics expectations, but to be prepared to succeed in college science classes, they also need to be able to apply these math skills within the context of the science disciplines, meaning that students can actually use those math skills to solve problems, develop and use models, and describe phenomena in the sciences.

The faculty panel believes that students who master this entire set of expectations should be well prepared for a high level of success in the first level of college coursework in the sciences. We, therefore, urge the development of valid and reliable assessments that not only provide summative, but also useful formative assessment, at every stage of a student's K-12 education, so that students can progress smoothly and consistently towards this complete level of mastery.

## College-Level Learning Skills Required for All Students

To be fully prepared for college level coursework, students should be competent and capable, self-regulated, college-level learners. Such learners are able to:
A. Learn science using a variety of sources including, but not limited to:

1. Standard college-level science textbooks;
2. Inquiry-based laboratory experiences that engage students in asking valid scientific questions and gathering and analyzing information;
3. Well-reasoned and evidence-based discussions of science principles, concepts and problems with well-prepared peers and faculty;
4. Well-organized lectures delivered at an appropriate cognitive level for first-year STEM college students by college faculty; and
5. Other appropriate sources of science information in the popular press and in other sources such as research reports and summaries that are at an appropriate cognitive level for first-year college students.
B. Reliably and accurately assess their learning and take effective action to remediate their deficiencies, prior to instructor-administered summative assessments; and
C. Persist in their learning despite encountering initial difficulty in mastering challenging material and seek and use alternative learning strategies when they find that their initial strategies are not as effective as desired, so that they consistently meet their learning goals and achieve the targeted learning outcomes.

## Science Content Knowledge and Science and Mathematics Skills Needed by Students Who Will Only Enroll in General Education Natural Science Courses for Non-Science Majors

## Science Content Knowledge

General education science courses are designed with lower level expectations for students' prior knowledge of the content in specific natural science disciplines than science courses intended for college students majoring in the natural sciences. To be well prepared for these courses, students should satisfactorily complete the Ohio graduation requirements for science and mathematics, meeting all of the expectations specified in the New Ohio Learning Standards: K-12 Science for each of those courses. The Ohio graduation requirement specifies that students must satisfactorily complete the following high school science courses: biology, physical science, and one advanced science course. Students who master the science content and process skills specified in the Ohio Career and College-Ready Standards model curricula for three science courses should have sufficient content knowledge and science process skills to be ready to learn what is expected in
general education courses that meet the Ohio Transfer Assurance Guidelines (TAG) and are designed for students to achieve TAG learning outcomes.

## Science Mathematics Skills

Students also should be able to consistently demonstrate mastery of the first five Recommendations in "Mathematical Expectations for College Readiness 2011" within science contexts. Students should be able to demonstrate mastery of these processes, concepts, functions, applications, and operations by creating models of physical realities related to those models. Students should also be able to use the models they create to reliably and consistently solve problems dealing with the concepts and relationships described in the Syllabus and Model Curriculum of the Ohio Revised Science Standards for the science courses that they have taken in high school. These students do not need to be able to demonstrate the "Additional Expectations for Calculus."

## Rationale

Since general education science courses for non-science majors presume relatively low-level science content knowledge, the exact science content that students have mastered is not as critical as it is for science majors. However, that does not mean that these students need not have mastered or used any science content. If students completely lack familiarity with the nature of scientific knowledge and some of the core scientific content, they would have a very weak ability to construct new knowledge in the sciences. Thus, to be prepared to learn science content at the level expected in college non-majors science courses, students need mastery of some general science concepts and the following scientific processes so that they are proficient at constructing new science knowledge and understanding:
A. Identify questions and concepts that guide scientific investigations;
B. Design and conduct scientific investigations;
C. Use technology and mathematics to improve investigations and communications;
D. Formulate and revise explanations and models using logic and evidence (critical thinking);
E. Recognize and analyze explanations and models; and
F. Communicate and support a scientific argument.

This level of mastery should be accomplished by satisfactory completion of three high school science courses as defined by the syllabi and model curricula of the New Ohio Learning Standards: K-12 Science.

## Science Content Knowledge and Science and Mathematics Skills Needed by Students Who Will Take Natural Science Courses Intended for Those Majoring in the Natural and Health Sciences

To be prepared to succeed in college-level courses in the natural sciences at Ohio universities and colleges, in addition to the College-Level Learning Skills defined above, students should know and be able to do the following:
A. Consistently demonstrate mastery of the learning outcomes defined by the Syllabus and Model Curriculum of the New Ohio Learning Standards: K-12 Science for the high school level course corresponding to the college course that they will be taking. This means that students who will take the introductory biology course intended for science majors should have mastered the learning outcomes defined by the Syllabus and Model Curriculum for biology, those planning to take the introductory chemistry course for science majors should have mastered the learning outcomes defined by the Syllabus and Model Curriculum for chemistry, and those planning to take the introductory physics course for science majors should have mastered the learning outcomes defined by the Syllabus and Model Curriculum for physics. Those students planning to study Geology or Environmental Science in college should have mastered the learning outcomes for chemistry since college-level geology and environmental science courses typically expect students to have mastered this chemistry content knowledge. They need not have mastered the learning outcomes for high school Physical Geology. Although that course would convey an advantage to those high school students who complete it, the content in that course need not have been previously mastered for students to be adequately prepared for first-year geology courses in college and if a student has to choose between high school Chemistry and high school Physical Geology, they will be better prepared for college-level geology courses by completing the high school Chemistry course.
B. Consistently demonstrate mastery of the first five Recommendations in "Mathematical Expectations for College Readiness 2011" within science contexts, meaning that students can demonstrate these skills in creating models of physical realities within those contexts and use those models to reliably and consistently solve problems dealing with the concepts and relationships described in the Syllabus and Model Curriculum of the

New Ohio Learning Standards for the type of science course that they plan to take in college. Students who are planning to major in chemistry, physics, engineering or other majors that require calculus within the first two years of college should be able to consistently demonstrate their mastery of the "Additional Expectations for Calculus." Problem solving skills are absolutely essential for college-level work in the sciences. So facility with this aspect of mathematics within the specific science disciplines that students will be studying is critical for student success at the college level.
C. Write effectively in a technical scientific style consistent with the discipline, at a level appropriate for college level work.
D. Communicate technical scientific information with appropriate visual and graphical tools.
E. Work together with peers to design a solution to a multifaceted, complex problem involving science inquiry or technology or engineering design.

## An Additional Recommendation for Students Planning to Major in a Field of Engineering

In addition to the above expectations, students planning to major in a field of engineering should also be able to analyze products, devices, machines and systems in order to discover the principles on which they are based.

## Recommended Mathematical Expectations for College Readiness 2011

A large percentage of Ohio college freshmen find that they are not "ready" for entry level college coursework. In mathematics, $32 \%$ of Ohio's recent graduates enrolling at Ohio public colleges or universities in fall 2008 took remedial mathematics during their first year of college. ${ }^{3}$ Reducing the number and percentage of students taking remedial mathematics courses is challenging. Nonetheless, an important first step is to define clearly the mathematical expectations for students who enter two- and four-year colleges. These expectations should help guide college and high school faculty, and, most importantly, assist students and their parents in planning secondary and postsecondary coursework.

Defining the mathematics and statistics students need to know as they enter college may sound simple. In fact, it is a challenging endeavor, requiring those who undertake it to examine the nature of mathematics and pedagogy and think seriously about the mathematics that will be needed in the future by all students. Certainly, students who will take calculus as entering freshmen require a different level of preparation and competence than students who take introductory credit-bearing courses. The first part of this document describes the standards for the latter group. Also included are the additional expectations for incoming college students who wish to enroll directly into college calculus courses. These expectations are drawn from the pre-calculus outcomes in the Mathematics Transfer Assurance Guide.

This document is a revision of a set of expectations first articulated in 2006. The work, done under the auspices of the Ohio Board of Regents and the Ohio Department of Education, involved both higher education faculty and high school mathematics teachers. These revised expectations are consistent with the Common Core State Standards for Mathematics that have been adopted by Ohio, and in no way should be viewed as replacing those standards.

The panel creating this document made a conscious effort to limit the content to the essential mathematics needed for successful completion of entry-level college mathematics courses. This document represents minimal expectations. Thus, this document omits some traditional and appealing concepts that would provide an enriched mathematics background. It is understood and expected that many secondary students will learn more mathematics than is reflected here. Students intending to pursue mathematically intensive programs and careers after high school would benefit from a more comprehensive and rigorous study of mathematics. The panel believes, however, that the core expectations outlined in this document will provide students with a sufficient knowledge base for success; and it is essential that students have more than a passing

[^4]acquaintance with these ideas. Students must retain this foundation well beyond the confines of any one course and be able to apply these concepts and skills to both routine and non-routine problems, drawn from a variety of contexts.

## Expectation 1: Mathematical Processes

Mathematical processes are intertwined with content. In the best of all worlds they would be intertwined to the point that it is unnecessary to mention them. However, in addition to essential numeric, algebraic, geometric and data skills, students need to possess mathematical process skills in order to be successful in post-secondary education. These skills include communication, reasoning and using technology-but perhaps most important are problem solving skills. Students should have frequent experiences with rich mathematical problems that engage them in problem solving-a process deeper than that of practicing a new technique on a classified category of word problems. Problem solving should contribute to the development of mathematical habits of mind (e.g., perseverance, questioning, independence, reflection, connecting) and develop an appreciation for and a disposition toward problem solving as the paramount aim of learning mathematics.

Students are expected to:
A. Solve Problems

1. Use a variety of problem solving strategies;
2. Reflect on and analyze their own problem solutions and the solutions of others;
3. Connect ideas in a variety of context; and
4. Solve complex, non-routine and multi-step problems that may require student formulation of problems and/or sustained thought and effort.
B. Communicate with Mathematical Ideas
5. Use correct mathematical terminology and notation;
6. Show a logical progression of thought, clearly and coherently, orally and in writing;
7. Read mathematical material with understanding and independence;
8. Use appropriate degrees of precision based upon problem context; and
9. Use exact answers (e.g., $\sqrt{ }$ or $\pi$ ) when appropriate.
C. Reason Mathematically
10. Understand the need for proof in mathematics; recognize when a proof is required;
11. Understand the difference between a statement verified by proof and one illustrated by using examples;
12. Understand the meaning of logical terms (e.g., and, or, but, not, if ... then); and
13. Understand the significance of and roles played by definitions, assumptions, theorems/propositions, examples, and counterexamples in mathematics.
D. Connect Mathematical Concepts
14. Connect mathematics with a variety of disciplines and workplace and everyday settings; and
15. Use connections among and within branches of mathematics (e.g., algebraic properties of a function and geometric properties of its graph).
E. Use Technology and other Tools Appropriately
16. Use a variety of tools to solve mathematical problems-ranging from common tools (e.g., rulers, protractors) to technology-enhanced tools (e.g., calculators, computers, spreadsheets);
17. Use technology to collect organize and analyze information with the goal of interpretation, presentation and argumentation and as motivation for proof; and
18. Use appropriate technology to enhance and support student learning.

## Expectation 2: Number and Operations

Concepts from number and operations form the basis for understanding of algebra and work with symbols. Students should be proficient with arithmetic operations and their properties on integers, rational numbers and real numbers. They should demonstrate number sense and compute fluently, including mental methods, and make reasonable estimates. Students should possess a
basic understanding of the real number system and the way the natural numbers, whole numbers, integers, rational numbers, and irrational numbers relate to one another.

Students are expected to:
A. Structure of the Number System

1. Understand and convert between different representations of numbers (decimal, percent, fraction, scientific notation, radicals...); and
2. Explain the effects of operations on the magnitudes of quantities and signs of numbers.
B. Operations
3. Perform arithmetic operations on various forms of real numbers;
4. Compute and explain the solutions to problems involving ratio, proportion, percent, scientific notation, square roots and numbers with integer and rational exponents; and
5. Apply and generalize properties of operations (including order of operations) as a foundation for algebra.
C. Estimation
6. Estimate the solutions to problems involving ratio, proportion, percent, scientific notation, square roots and numbers with integer and rational exponents.

## Expectation 3: Algebra

Algebra continues to be the most fundamental prerequisite for success in college mathematics. Algebra provides a language and structure that allows students to create representations, model and generalize mathematical ideas. It is concerned with change, patterns and dealing with concepts at a more abstract level than in arithmetic. In addition to competence with manipulation of algebraic objects, students should be able to model and solve problems using a variety of algebraic methods.

Students are expected to:
A. Equations and Inequalities

1. Algebraically solve linear equations in one variable, including examples with no solution, one solution, and infinitely many solutions;
2. Solve systems of linear equations with two unknowns by graphing, substitution, and addition/elimination; including examples with no solution, one solution, and infinitely many solutions;
3. Solve quadratic equations by graphing, factoring, completing the square, and using the quadratic formula (including equations that have complex solutions);
4. Algebraically solve linear inequalities and represent solutions in multiple ways such as graphically, inequality notation, and interval notation;
5. Algebraically solve absolute value equations in the form $|A x+B|=C$ and related absolute value inequalities and represent solutions in multiple ways;
6. Algebraically solve equations that include rational expressions or radicals including examples that generate extraneous solutions;
7. Solve for specified variables in literal equations; and
8. Solve exponential equations in one variable using logarithms.

## F. Operations with Algebraic Objects

1. Perform operations with exponents and radicals, including laws of exponents, with both numerical and algebraic expressions;
2. Add, subtract, multiply and divide rational expressions by hand and identify values where they are undefined. (Limit numerators and denominators to monomial, linear and quadratic expressions);
3. Evaluate and simplify algebraic expressions; and
4. Add, subtract, multiply and divide polynomial expressions (limit divisors to monomial and linear expressions).
G. Graphing
5. Graph linear equations and inequalities and quadratic equations in two variables, with and without technology (limit quadratic equations to vertical and horizontal parabolas);
6. Graph common functions (e.g., absolute value, square root, linear, quadratic, rational, exponential, piecewise) with and without technology;
7. Read a graph to interpret solutions to an equation and identify and interpret characteristics such as intercepts, extrema, and rates of change;
8. Graph transformations of functions (limit transformations to vertical and horizontal shifts, reflections, and stretches); and
9. Interpret transformations of functions from both a graphical and algebraic perspective.
H. Functions and Applications
10. Define functions; determine whether a relationship between two variables (represented in a variety of ways) represents a function; identify, as appropriate for the context, both the domain and range of a function; and use function notation;
11. Describe how a change in one variable affects the value of a related variable, for example, problems involving direct and inverse variation;
12. Interpret sequences as functions whose domain is a subset of the whole numbers. Solve problems with arithmetic and geometric sequences;
13. Adjust the parameters of function families to model relationships between variables (function families include linear, quadratic, piecewise, absolute value, square root, power and exponential); and
14. Formulate equations or functions that model problems in a variety of contexts.

## Expectation 4: Geometry

Geometry is the place where students learn about shapes and space. It is also a natural place for students to use careful deductive reasoning. Students analyze mathematical situations and solve problems using geometric objects and ideas.

Students are expected to:
A. Structure

1. Describe and explain the different roles of assumptions, definitions, theorems and proofs in the logical structure of geometry;
2. Use theorems about parallel and perpendicular lines, angles, congruent figures, similar figures, right triangles (e.g., Pythagorean Theorem),
polygons, circles, polyhedrons, spheres, cylinders, and cones to solve problems;
3. Prove theorems about lines, angles, triangles, and parallelograms;
4. Use similarity to solve problems and to model proportional relationships; and
5. Use right triangle trigonometry to solve problems.
B. Geometric Representations
6. Represent geometric objects algebraically using coordinates (analytic geometry);
7. Use algebra to solve geometric problems;
8. Draw and define reflections, rotations, translations, and dilations of geometric objects and understand compositions of these transformations;
9. Define, describe, and identify reflectional and rotational symmetry; and
10. Express transformations algebraically (i.e., using coordinates).
C. Measurement
11. Explain that the geometric measures (length, perimeter, area, volume) depend on the choice of unit, and that measurements are approximations;
12. Explain the effect of a scale factor on length, perimeter, area, and volume;
13. Calculate the perimeter and area of common plane figures and the surface area and volume of solids;
14. Distinguish between exact and approximate values. Explain differences among accuracy, precision, and error, and describe how errors affect later calculations;
15. Solve problems involving measurement, including problems requiring a choice of scale and unit; and
16. Convert fluently from one measurement unit to another, within and across systems.

## Expectation 5: Probability and Statistics

Statistics and probability form the basis for understanding situations involving variability. Beginning with questions, data are gathered, displayed, summarized, and interpreted in order to identify patterns and deviations from patterns and to make predictions. In a world increasingly inundated with data, it is essential that all students become familiar with ways data is used and misused.

Students are expected to:
A. Data Displays and Interpretation

1. Create and/or interpret graphical displays to describe sets of data (e.g., box-and-whisker, scatterplot, frequency distribution, normal distribution); and
2. Find and interpret measures of central tendency and variability for sets of data.
B. Representations and Use of Data
3. Use the context to determine appropriate way(s) to represent data, and understand the advantages and disadvantages of various representations;
4. Identify misuses of data;
5. Distinguish between correlation and causation; and
6. Understand the characteristics of well-designed studies (e.g., lack of bias, sampling methods, randomness) in order to interpret results.
C. Probability Concepts
7. Use the fundamental counting principle to determine the number of possible outcomes;
8. Compute probability of compound events, independent events, and simple dependent events; and
9. Compare experimental and theoretical results for simple experiments.

## Additional Expectations for Calculus

The expectations outlined above will help assure that students are ready for college. If a student plans to enroll in a calculus course upon entering college that student should also have
facility with the following which are drawn from the Ohio Board of Regents description of a Precalculus Course (TMM002). The codes in parentheses indicate Pre-calculus outcomes that are already included or partially included among the expectations for all students.
A. Functions

1. Represent functions verbally, numerically, graphically and algebraically, including linear, quadratic, polynomial, rational, root/radical/power, piecewise-defined, exponential, logarithmic, trigonometric and inverse trigonometric functions (3.C.2, 3.C.3, except logarithmic and trigonometric functions);
2. Determine whether an algebraic relation or given graph represents a function (3.D.1);
3. Perform transformations of functions-translations, reflections and stretching and shrinking (3.C.4, 3.C.5);
4. Perform operations with functions-addition, subtraction, multiplication, division and composition;
5. Analyze algebraic structure and graph of a function, including those listed in 1.1 to determine the intercepts, domain, range, intervals on which the function is increasing, decreasing or constant, the vertex of a quadratic function, asymptotes, whether the function is one-to-one, whether the graph has symmetry (even/odd), etc. and given the graph of the function to determine possible algebraic definitions. (3.C.3; 3.D.1, 2,4);
6. Find inverse of functions listed in 1.1 and understand the relationship of the graph of a function to that of its inverse;
7. Use the Remainder and Factor Theorems for polynomial functions; and
8. Use functions, including those listed in 1.1 to model a variety of realworld problem solving applications (3.D.4).
B. Equations/Systems
9. Understand the difference between an algebraic equation of one, two or more variables and a function, and the relationship among the solutions
of an equation in one variable, the zeros of the corresponding function, and the coordinates of the x-intercepts of the graph of that function;
10. Determine algebraically and graphically whether the graph of an equation exhibits symmetry;
11. Solve a variety of equations, including polynomial, rational, exponential, and logarithmic, trigonometric and inverse trigonometric, including equations arising in application problems. (3.A.1,3,5,6, except logarithmic and trigonometric equations);
12. Solve a system of linear equations graphically and algebraically by substitution and elimination and solve application problems that involve systems of linear equations. (3.A.2);
13. Identify and express the conics (quadratics in two variables) in standard rectangular form, graph the conics, and solve applied problems involving conics; and
14. Solve polynomial and rational inequalities graphically and algebraically.
C. Sequences/Series
15. Represent sequences verbally, numerically, graphically and algebraically, including both the general form and recursively (3.D.3);
16. Write series in summation notation, and represent sequences of partial sums verbally, numerically and graphically; and
17. Identify and express the general term of arithmetic and geometric sequences, and find the sum of arithmetic and geometric series (3.D.3).
D. More Trigonometry
18. Express angles in both degree and radian measure;
19. Define the six trigonometric functions in terms of right triangles and the unit circle;
20. Solve right and oblique triangles in degrees and radians for both special and non-special angles, solve application problems that involve right and oblique triangles (4.A.5);
21. Verify trigonometric identities by algebraically manipulating trigonometric expressions using fundamental trigonometric identities, including the Pythagorean, sum and difference of angle, double-angle and half-angle identities; and
22. Solve a variety of trigonometric and inverse trigonometric equations, including those requiring the use of the fundamental trigonometric identities listed in 4.4, in degrees and radians for both special and nonspecial angles. Solve application problems that involve such equations.
E. Vectors
23. Represent vectors graphically in both rectangular and polar coordinates and understand the conceptual and notational difference between a vector and a point in the plane;
24. Perform basic vector operations both graphically and algebraicallyaddition, subtraction and scalar multiplication; and
25. Solve application problems using vectors.

## Recommended Assessments <br> to Determine College Readiness / Remediation-Free Status in Math and Science

In establishing threshold scores to deem a student exempt from institutional placement testing for the purposes of remediation, the recommended expectations and related assessment provide a threshold that institutions may not exceed. While it is recommended that institutions be allowed to set the threshold scores lower than the measures detailed below, these recommendations specify that they not be allowed to set the threshold scores higher than those listed below. Thus students achieving higher scores than specified below would be guaranteed they would not be placed in remedial, non-credit-bearing courses for the specific fields indicated. However, individual institutions can decide which students scoring below these levels would be placed in remedial courses.

It is strongly recommended that in designing remediation placement procedures for students scoring below the threshold scores, that institutions further assess student preparation utilizing multiple measures to determine the optimal plan to accelerate the student's enrollment in and completion of credit-bearing courses. Such measures could include review of high school grade point average, a writing assessment, and a review of previous college work.

It is further recommended that institutional policies provide innovative models of support for students scoring below the threshold scores, including supplemental instruction, co-enrollment in credit-bearing courses, refresher courses delivered in a module format, and other delivery methods that produce successful outcomes for students.

## English Assessments

| Assessment | Threshold Score* |
| :--- | :--- |
| ACT | 18 English Exam |
| SAT | 430 Writing <br> 450 Critical Reading |
| ACCUPLACER | 88 English; 70 Sentence Skills |
|  |  |

Reading Assessments

| Assessment | Threshold Score* |
| :--- | :--- |
| Enhanced ACT Reading Score | 21 |
| COMPASS | 87 |
| SAT Reading Sub Score | 450 |
| ACCUPLACER Reading Scale Score ${ }^{4}$ | 102 |
| ASSET Reading Skills Score | 45 |

## Math Assessments

| Assessment | Threshold Score |
| :--- | :--- |
| ACT Math Sub-Score | $24^{* *}$ |

*Admitted students achieving or exceeding these scores are guaranteed exemption from placement into non-credit remedial courses on the basis of English Language Arts (ELA) literacies and are guaranteed exemption from requisite institutional placement testing for purposes of remedial placement based on ELA literacies.
**Admitted students who score 24 or higher on the Math ACT (or equivalent SAT Math subscore) are guaranteed exemption from placement into non-credit remedial courses and exemption from requisite institutional placement testing for remedial placement. The previously established Ohio placement policy that set a minimum threshold of an ACT mathematics sub-score of 22 remains in effect and institutions should continue to reach a score of 22 at a minimum for placement in non-remedial first-college level mathematics courses. An ACT mathematics sub-score of 24 , however, guarantees a student placement in a degree applicable, credit-bearing mathematics and statistics courses, without a placement test, that are recognized for transfer.

The Math/Science Panel recognizes that some academic programs (STEMM in particular) require College Algebra, which generally carries as a pre-requisite satisfactory completion of an intermediate algebra course or particular levels of achievement on institutional placement testing. There is a desire for flexibility regarding placement into College Algebra courses due to faculty concern about the lack of student success in this course. This desire for flexibility founded in faculty concern for student success leads to the Math/Science Panel's recommendation of an ACT math

[^5]score of 24 as the maximum (ceiling) an institution could require for placement into its College Algebra course.

It is critical to understand that institutions are not required to place students scoring below the threshold score into remedial courses. Students scoring below the threshold score are subject to institutional placement procedures to gain eligibility to enroll in credit-bearing courses. Such procedures should include review of high school grade point average and other assessments, and a review of previous college work. Institutions should develop placement procedures and practices that are best suited for the specific resources that they have available to promote student success, tailored for the specific student populations that they serve.

## Science Assessments for STEM Majors

To assess a prospective STEM major's preparedness for success in college level courses, it is important to assess their math abilities, reading comprehension, and science reasoning skills. The Math and Science Panel does not recommend setting a threshold score for the ACT Science exam, as the focus of this assessment is on science reasoning and not science content, thereby making the assessment redundant to the reading comprehension assessment.

For STEM majors, there is significant advantage in mastering some core chemistry content to be considered ready for the first college level chemistry courses. To determine whether students are ready for success in college level science courses for majors, an assessment is needed to determine if they have mastered the science content; however, such an assessment that is appropriate, readily available for use at the high school level, and affordable is not currently available. The Ohio Department of Education plans to institute end-of-course assessments for Physical Science and Biology high school courses to be administered in 2014-15 and will likely develop end-of-course assessments for Chemistry and Physics courses subsequently. The Math and Science Panel recommends that these end-of-course assessments be adopted as indicators as soon as they are available.

Until better assessments of science content knowledge are available, the Math and Science Panel recommends that campuses be allowed to use their own assessments of science content to supplement the other sources of information such as ACT scores, high school grade point average (GPA), and other indicators of college readiness in determining the college readiness in science for STEM majors.

## Assessing College Readiness in Cognitive and Non-Cognitive Skills

In addition to mastery of content knowledge, to be college ready in the 21st century, students must demonstrate mastery of cognitive learning strategies, responsibility for their own learning, time management, study skills and habits, critical thinking abilities and non-cognitive skills required for postsecondary success. Mastery of these skills is included as a key part of a multifaceted college readiness definition for Ohio students.

It is recommended that colleges and universities administer authentic assessments of college readiness in order to ensure students are best positioned for success when beginning their postsecondary experiences. Authentic assessments confront students with the kinds of problems they will encounter as college students and subsequently as professionals and engaged citizens. In authentic assessments, students are required to draw upon a wide variety of skills, accessing and drawing meaning from multiple information sources to develop cogent responses (Austin, 2010) ${ }^{5}$. Authentic assessments must be based on a multi-faceted definition of college readiness, and if used effectively, can help reform the placement process in colleges and universities.

## Multiple-Measure Assessment Approach

College and work readiness in math, reading, and writing must be determined through the use of multiple-measure assessment approaches that include evaluation of key academic and nonacademic risk factors. Effective placement relies on effective assessment of student learning and performance on tasks directly related to the tasks students will be doing in the courses into which they are placed. Effective assessment practices must consider multiple measures, including but not limited to high school performance, ACT scores, previous college experience, and non-cognitive assessments.

## Assessing Non-Cognitive Skills

Non-cognitive skills include a range of behaviors that reflect greater student self-awareness, self-monitoring, and self-control-study skills, work habits, time management, help-seeking behavior, and social problem-solving skills. Meeting the developmental demands of college requires behavioral, problem-solving, and coping skills that allow students to successfully manage new environments and the new academic and social demands of college ${ }^{6}$.

[^6]It is strongly recommended that institutions implement authentic assessments of students' non-cognitive skills among the multiple measures employed to determine optimal placement for student persistence and success.

Available assessments of non-cognitive skills include the Noel-Levitz College Student Inventory (CSI) and integrated assessment, and the Grit-S Assessment (Duckworth, A., \& Quinn, P., 2009). Duckworth, Peterson, Matthews, and Kelly (2007) introduced the construct of grit, defined as traitlevel perseverance and passion for long-term goals, and showed that grit predicted achievement in challenging domains over and beyond measures of talent.

In addition to non-cognitive assessments, a number of advising software packages are available to support individualized academic planning to support persistence and completion.

## Section II: <br> Recommendations Beyond Scope of ORC Section 3345.061 (F)

## Policy and Practice Recommendations for Student Success

## Continuous Improvement Across the P-20 Continuum

Postsecondary institutions in Ohio prepare the majority of educators for the state's elementary and secondary schools. Given the importance of this role in the P-20 continuum, it is strongly recommended that aggregate student assessment results be used to inform collaborative and continuous improvement efforts for both educator preparation programs and discipline-specific content preparation provided by colleges of arts and sciences. It is further recommended that assessment results be used to inform secondary school curriculum and instruction to align high school and post-secondary student expectations and requirements for successful student transition.

## High School / Higher Education Alignment

It is recommended that postsecondary institutions and secondary schools adopt and implement policies and practices that encourage and support collaboration between postsecondary faculty and high school faculty to assure alignment of the expectations for students moving from secondary to post-secondary education. A shared understanding of the content taught and skills developed at each educational level will support educator efforts to support students in a successful transition to and through the next level of learning.

It is recommended that the summer writing workshops bringing together high school and postsecondary writing faculty be reinstituted.

## High School Assessments

It is recommended that the state implement common end-of-course and end-of-year assessments to measure student mastery of course outcomes and preparation for college and that the assessment outcomes be utilized to inform educational plans for high school students as they prepare for college and careers. These individualized plans should include course selection and sequencing, supplemental instruction, and academic major/career exploration.

It is recommended that the Early Math Placement Test be reinstituted for all Ohio students

## Increasing College Knowledge among High School Students

Sociological researchers emphasize that in addition to measured qualifications, a student's college readiness will be shaped by whether he or she has the information, resources, and skills necessary to effectively navigate the college admission process-college knowledge. College knowledge may contribute to significant disparities in college readiness by income and race and ethnicity, with low-income and minority students facing barriers to college access beyond their qualifications and point to the importance of understanding the college application process, the
financial aid system, and the range of choices within the postsecondary system, as well as being able to navigate these complex processes and systems. Successfully enrolling in college requires such knowledge, which high schools can support by providing norms, information, and guidance about college to their students (Roderick, M., Nagaoka, J., Coca, V., 2009). ${ }^{7}$

It is recommended that high schools and postsecondary institutions collaborate to provide college information to students beginning in the middle grades, and sustaining the effort throughout the high school years. It is recommended that these strategies engage parents and guardians in the communication efforts.

## Placement Test Preparation

It is recommended that postsecondary institutions that employ placement exams implement mandatory preparation experiences for placement testing. The preparation sessions should consist of orientation-to-the-test information and a review of math concepts involved in the tests prior to placement testing.

## Placement Summit

The recommendations contained within this report constitute expectations and assessment thresholds for a statewide remediation-free guarantee for students. Beyond a remediation-free guarantee, there is a need for an improved statewide placement policy for postsecondary institutions in Ohio. Currently (2012), placement policies throughout the state are widely varied due to the variety of institutional missions across the state.

It is recommended that the Ohio Board of Regents coordinate a statewide placement summit to document current placement policies across institutions and to explore what resources and ideas might be shared to support student success.

[^7]
## Report of the Wright State University Faculty Senate ad hoc committee on Student Success Jan 2012

The report Access, Progress, Success: Recommendations for Increasing Retention and Graduation in the Semester Transition (the APS Report) was submitted to the Faculty Senate in late October, 2011 [http://www.wright.edu/administration/senate/senage/documents/AccessProgressSuccessReport.pdf]. The APS Report presents a summary of academic challenges faced by Wright State University (WSU) and begins a focused conversation on specific potential strategies for improving retention and graduation rates. In response to the APS Report, the Executive Committee of the WSU Faculty Senate has charged this ad hoc committee to review the report so "as to be able to make recommendations to the Faculty Senate at its January, 2012 meeting regarding the report as a whole and its recommendations in particular and to make recommendations of its own regarding how Faculty should participate in ensuring the success of our students."

## Committee Membership

- Ann Bowling, representing the College of Nursing and Health
- Rich Bullock, representing the College of Liberal Arts
- Joe Coleman, representing the Raj Soin College of Business
- Travis Doom, representing the Faculty Senate Executive Committee, Chair
- David Kender, representing the College of Engineering and Computer Science
- Anna Lyon, representing the College of Education and Human Services
- Corey Miller, representing the College of Science and Mathematics
- Weiqun Zhang, representing the Lake Campus


## Highly Recommended for Immediate Action

This section of the report contains recommendations that the committee feels are the most worthy of consideration for immediate action. This set of recommendations includes both high impact changes and worthy recommendations with less impact whose low-cost or relative ease of deployment encourage immediate action.

## Recommendation \#1: Formation of a University College Curriculum Committee

 The ad hoc committee strongly recommends that the Faculty Senate establish a standing curriculum committee for University College. The UVC Curriculum Committee shall recommend to the Faculty Senate, via UCAPC, courses and policies affecting UVC courses and the first year experience. Furthermore, the UVC Curriculum Committee shall provide long-term faculty oversight of first-year outcomes and provide periodic recommendations onuniversity-wide admissions policies, remediation strategies, joint-enrollment program articulations, and the like. This body should consist of no fewer than four faculty members from the university at large (appointed by the Faculty Senate) and a like number of University College staff (appointed by the Dean of University College). The Dean of the University College may serve ex officio as a non-voting member of the UVC Curriculum Committee.

## Be It Resolved that:

WSU shall maintain a University College Curriculum Committee as a standing committee of the University College. The UVC Curriculum Committee is charged with the ongoing evaluation of UVC courses, the first-year experience, and policies that affect first-year students. This includes, but is not limited to, long-term oversight of first-year outcomes, university-wide admissions policies, remediation strategies for conditionally admitted students, and join-enrollment programs. The committee is charged to recommend improvements as necessary to UVC courses and to forward policy recommendations to the appropriate bodies for consideration and action. At least one-half of the committee membership shall consist of faculty from the Academic Colleges. The remainder of the committee shall consist largely of UVC faculty/staff directly involved with the first-year experience. Committee members shall serve two-year staggered terms.

## Recommendation \#2: Ensure broad participation in University College Advisory Board

It is common practice in the academic colleges (and, in many cases, departmental units or programs) to solicit input regarding policy and curricular development from the constituencies that it serves through the use of an advisory board. The ad hoc committee recommends that the University College ensure broad participation in its advisory board including current students (having completed the first-year experience), recent alumni (3-5 years), local community college deans/advisors/faculty, and local high school principals/advisors/faculty. The advisory board shall continue to provide advice and feedback to University College and to the UVC Curriculum committee on current, planned, or desired changes to admissions policies, remediation strategies, and the first-year experience. Ideally, this body can also serve as a vehicle for outreach to local high schools and community college so that local students are better prepared for their first year at Wright State University.

## Be It Resolved that:

The University College Advisory Board shall include among its membership current students (having recently completed the first-year experience at WSU), recent alumni (3-5 years post-graduation), and administration/faculty from local high-schools and community colleges that prepare our incoming students.

Recommendation \#3: Conditional admission and placement for students with marginal GPA or low-ranking standardized entrance examination subject scores [APS Report, page 17]
Currently, Ohio applicants are unconditionally admitted to Wright State University if they meet two of the three following criteria: 1) high school GPA of 2.0 or higher, 2) 18 ACT composite or 840 SAT critical reading and math only, or 3) completion of college preparatory curriculum. Non-Ohio residents must meet higher criteria of a 2.5 high school GPA, 20 ACT composite or 960 SAT critical reading and mathematics, and must complete a college preparatory curriculum.

The six-year graduation rate for students meeting or exceeding the ACT and GPA admission standards is $56 \%$. As applicants only need to meet two of the three criteria, students are currently admitted unconditionally even if they do not meet the GPA or ACT/SAT criteria. The APS Reports that the six-year graduation rate for students who do not meet both of the GPA and ACT/SAT criteria is below $20 \%$.

The Faculty of Wright State University are committed to the mission of providing affordable, quality, and accessible education to qualified students in the Miami valley. However, the ad hoc committee agrees with the concerns noted in the APS Report that unconditional admittance of students who fail to meet all of the admissions criteria is not in the students' best interests. Therefore, we highly recommend the APS Report's proposal for conditional admission of such students requiring a mandatory course of action designed to improve these students' ability to transition to the university, maintain financial aid, and successfully graduate in a timely fashion. All students who qualify under WSU's existing admission requirements should be given an opportunity to demonstrate the necessary proficiency in mathematics and language skills vital to their university preparedness. Students who are not able to demonstrate the required proficiency may be admitted as jointly-enrolled students to allow them an opportunity to develop and demonstrate these skills at our community college partners or through Wright State preparatory programs.

Grade Point Average Requirement: Students who have completed a college preparatory curriculum and have demonstrated competence on national standardized examinations but have a high school GPA of less than 2.0 may be admitted conditionally. Such students should "be recommended for a joint-enrollment program with a collaborating community college in order to give the students an opportunity to demonstrate their ability to obtain the grade point average necessary to maintain good standing at Wright State and retain their eligibility for financial aid." [APS Report, page 17]

Language skills assessment requirement: "Students with a writing ACT score of 11 or less should be admitted conditionally" [APS Report, page 18]. Such students will be expected to successfully complete an appropriate course to cover the deficiency from another institution (such as a community college) or to successfully complete the Wright State Writing Academy summer bridge program before their first term of study.

Conditionally recommended students who fail to demonstrate their readiness prior to the start of the first term will be recommended for a joint-enrollment program.

Mathematics skills assessment requirement: "Students with a mathematics ACT score of 13 or less should be admitted conditionally" [APS Report, page 18]. Such students will be expected to successfully complete an appropriate course to cover the deficiency from another institution (such as a community college) or to successfully complete the Wright State Math Academy summer bridge program before their first term of study. Conditionally recommended students who fail to demonstrate their readiness prior to the start of the first term will be recommended for a joint-enrollment program.

The committee notes that the effective cut-off scores for the ACT Reading would be about the third percentile, and the second percentile for the ACT Mathematics (the ACT does not report percentile zero). The exact percentile is subject to change slightly based on a particular year's test. This is in effect the next to lowest possible score on both sub tests. An applicant to WSU would need to score higher than one percent of individuals taking the ACT in order to be potentially qualified for conditional admission.

The committee has some areas of concern regarding the implementation of this recommendation. We are concerned that this may decrease the size of the First Year class by about $8 \%$ (adding all those in the report data set that have high school GPAs less than 2.0 (150), ACT Reading less than 12 (134), or ACT Mathematics less than 13 (69)), while simultaneously increasing enrollment in the summer bridge academy. The summer bridge programs must have the necessary capacity to serve the student demand. In addition, the revision of admission criteria has the potential to disproportionately populations of students from regions that typically have lower ACT scores. This could affect the diversity of Wright State's first-year experience, and raises potential concerns over equal access to education. These potential issues should be monitored by the UVC Curriculum Committee.

## Be It Resolved that:

The Executive Committee of the Faculty Senate charge UCPAC to work with the appropriate administrative bodies (Undergraduate Enrollment, the Council of Deans, etc.) to formalize an admissions policy that allows the conditional placement of students in developmental programs that may substantially increase the likelihood of their academic success.

## Recommendation \#4: Early identification of deficiencies to allow pre-enrollment remediation [APS Report, page 13]

The committee strongly agrees with the fundamental principles for streamlining remediation presented in the APS Report. "The remedial curriculum should be designed with the objective of having students enroll in college credit-bearing courses at the earliest possible time. Students should be able to complete all remediation in a single semester" [APS Report, page 27].

The committee recognizes that early identification of deficiencies is vital to allowing students to prepare for their first-year experience. Automatic identification of deficiencies based upon standardized examination subject scores will allow students to remediate subjects in their final year of high-school, in community college coursework, or in summer bridge programs or academies.

Initial placement in writing and mathematics courses should be determined by the results of standardized examination subject scores. Input from the Mathematics Department suggests that students with an ACT Math score of 17-21 are currently recommended for developmental mathematics. Students with an ACT Math score of 22 or higher are recommended for College Algebra or higher. This approach allows students (and advisors) to determine an appropriate course of action well before enrollment. Local tools, such as the eCompass examination or submitting an essay for review should remain available to allow students to challenge/improve their initial placement based upon standardized examination subject score.

## WSU Current Admission Policy

[We are having some difficulty in locating the current "official" policy. Included for now is the unofficial summary from the university webpage].

## Ohio Residents

All Ohio residents who have graduated from an Ohio public or chartered high school will be considered for admission. For unconditional admission, a student must meet the following criteria:

- 2.0 or higher cumulative high school GPA
- 18 ACT composite or 840 SAT critical reading and math only
- Completion of college-preparatory curriculum


## Out-of-State Students

Out-of-state students must present evidence of an above-average ability to do college-level course work, which is generally illustrated by:

- 2.5 or higher high school GPA
- 20 ACT composite or 960 SAT critical reading and math only
- Completion of college-preparatory curriculum


## Proposed starting point for revision of admission policy (consistent with Recommendations \#3 and \#4)

For unconditional admission, a student must meet the follow criteria:

- 2.0 or higher cumulative GPA from a Ohio public or chartered high school or 2.5 or higher cumulative GPA from an out-of-state high school.
- Completion of a college-preparatory curriculum
- ACT Mathematics score of 22 or higher or SAT Quantitative score of 520 or higher
- ACT Writing score of 23 or higher or SAT Writing score of 530 or higher

Applicants who fail to meet the high-school GPA requirement but who meet the other requirements may be admitted conditionally as part of a joint-enrollment program with local community colleges in order to allow the student to mature and demonstrate their academic ability. Students who successfully complete the joint-enrollment program will be considered to have met this admissions requirement.

Applicants who fail to demonstrate the expected college-preparatory high-school curriculum may be admitted conditionally and notified of their preparatory deficiencies. Students will be expected to cover their high-school deficiencies in college-level coursework prior to achieving junior status.

Applicants who have not demonstrated mathematics preparedness may be admitted conditionally. Applicants with an ACT Mathematics scores between 14 and 21 (SAT Math between 350 and 519) may be admitted with a condition to demonstrate mathematics preparedness before the end of their first year of study or through the following (or equivalent) means: placement test score, successful completion of an appropriate remedial course from another institution (such as a community college), or successful completion of an approved summer program before their first term of study. Applicants with ACT Mathematics scores below 14 (SAT Math below 350) who fail to demonstrate preparedness may be admitted conditionally as part of a joint-enrollment program. Students that successfully complete the joint-enrollment program will be considered to have met this admissions requirement.

Applicants who have not demonstrated writing preparedness may be admitted conditionally. Applicants with ACT Writing scores between 12 and 22 (SAT Writing between 330 and 530) may be admitted with a condition to demonstrate writing preparedness before the end of their first year of study or through the following (or equivalent) means: placement test score, successful completion of an appropriate remedial course from another institution (such as a community college), or successful completion of an approved summer program before their first term of study. Applicants with ACT Writing scores of below 12 (SAT Writing below 330) that fail to demonstrate preparedness before the start of their first term may be admitted conditionally as part of a joint-enrollment program. Students that successfully complete the joint-enrollment program will be considered to have met this admissions requirement.

## Be It Resolved that:

The Executive Committee of the Faculty Senate charge UCPAC to work with the appropriate administrative bodies (Undergraduate Enrollment, the Council of Deans, etc.) to formalize an updated admissions policy that allows placement in developmental programs based upon standardized examination scores available at the time of application.

## Recommendation \#5: College placement by sophomore year [APS Report, pages 22-23]

The role of University College should be to provide an outstanding first-year experience for students. University College provides advising and remediation for students who are not able to enter the Academic College of their choice or who have not chosen an Academic College. Students must leave University College for Academic Colleges in a timely fashion in order to graduate without unnecessary delay.

The committee recommends that University College have all remediation completed in one semester and place all students in Academic Colleges by the end of their freshman year. Students who are not placed in an Academic College by the end of their first term as sophomores at WSU should be placed on academic probation. Students who have not selected or do not qualify for an academic college at the end of their second term as a sophomore must be considered for dismissal.

The committee recommends that all Academic Colleges review their direct and regular admissions processes for college entrance with these goals in mind.

## Policy: Placement in academic colleges by the sophomore year

Students must be accepted to an Academic College by no later than the end of their first semester at WSU with sophomore status (or higher). Students who fail to apply and qualify for admission to an Academic College by the end of their first semester at WSU as a sophomore (or higher) shall be placed on Academic probation.

## Recommendation \#6: Mandatory intervention for students on probation [APS

 Report, page 26]The committee strongly recommends the creation of a one semester credit hour course $U V C$ Recovery that shall be made mandatory for all students on probation. This course should serve as a study table environment similar to those found in Athletic Study Table programs. Furthermore, this course should serve as a scheduled opportunity for students to meet regularly with advisors to discuss academic and career counseling, to make students aware of campus resources, and to help students develop the necessary study skills for academic success.

Students who do not recover from probation are normally dismissed from the university. Students may appeal this decision. Students who fail to participate in the mandatory intervention shall have this failure weigh heavily against them in the appeals process.

## Policy: Mandatory enrollment in UVC Recovery for students on Probation

WSU students on Academic Probation must enroll in the course UVC Recovery while on probation. Petitions to avoid dismissal from the University from students who do not pass UVC Recovery in the semester prior to their dismissal shall be denied unless the petition shows that the student was unable to participate in the course.

## Recommendation \#7: Enhancing success for at-risk students [APS Report, page 32-34]

Factors other than academic preparedness and background play an important role in student success. The committee agrees with the APS Report recommendation that University Organizations that provide services to at-risk students should work with University College to encourage students to make appropriate use of an expanded Student Academic Success Center. The Student Academic Success Center and Bolinga multicultural center should be focused on student success and may require additional university resources to meet their expanded mission.

## Be It Resolved that:

UCAPC shall work with the administration to focus and expand the resources of our Student Centers towards student academic success.

## Recommendation \#8: Develop joint-enrollment, collaborative programs with all local community colleges [APS Report, page 16]

Joint-enrollment programs allow students to stay connected with Wright State while advancing or rescuing their academic careers at lower cost institutions more traditionally focused on developmental material. Joint-enrollment partnerships provide academically or financially at-risk students room to grow academically with less financial burden and with less threat to long-term eligibility for federal financial aid. To maximize student flexibility, WSU should form such partnerships will all community colleges in the region. Jointenrollment curriculum oversight should be overseen by the UVC Curriculum Committee.

The committee highly recommends that students whose academic preparedness falls below the threshold for statistically likely success at WSU be required to begin their academic careers at a partner community college under advisement from WSU University College advisors. Other students may voluntarily choose to enter the joint-enrollment program for non-academic reasons, such as cost or location. The loss of these students will cause enrollment declines in developmental and first-year courses and limit WSU's ability to proactively intervene with these students. The hope is that success for students who are able to mature academically in their first-year joint-enrollment program will be greatly increased when they transition to full-time students at WSU. The number, demographics, short-term success, and long-term success of students who use these joint-enrollment programs must be carefully monitored by the UVC Curriculum Committee to ensure a smooth transition to WSU.

## Be It Resolved that:

The University shall expand its joint-enrollment program to include all local community colleges.

## Recommendation \#9: Summer Bridge Program: WSU Mathematics Academy [APS Report, page 15]

Early identification of deficiencies (Recommendation \#4) encourages pre-enrollment remediation. The APS Report recommends that the WSU Mathematics Department establish a pre-enrollment 4 -week summer academy designed to prepare students for regular developmental coursework.

The committee agrees that students assessed in lower levels of remediation should be provided with multiple pre-enrollment means for preparation. The committee unanimously agrees that a summer mathematics bridge program similar to the summer Writing Academy is worthy of immediate action. The APS Report proposes that the Mathematics Academy run in the same time frame but opposite to the Writing Academy. Some faculty are concerned that running the programs simultaneously may reduce the effectiveness of both programs as at-risk students may manage their time poorly. The committee is in favor of running the Academies simultaneously in the AM/PM, but recommends that the effectiveness of the bridge programs for students enrolled in only Writing, only Math, or both programs be tracked for future effectiveness planning. This is a worthy initiative and university resources should be allocated to its implementation and success.

## Be It Resolved that:

The University College shall work with the WSU Mathematics Department to develop and pilot a 2012 Summer Mathematics Academy. The goal of this Academy shall be to prepare and evaluate students for preparedness for a one semester Mathematics remediation course during their first year.

## Recommendation \#10: Expanding opportunities for top scholars [APS Report, page 31]

"The Honors Program, in conjunction with enrollment Management and the colleges, should develop an extensive recruiting program to attract Honors eligible students from High Schools throughout the Dayton region" [APS Report, page 31]. "To support for the growth in the Honors Program, the University should adopt a budgeting model that recognizes and encourages growth in the program by ensuring that funding is available to provide the courses and support needed by the increasing numbers of Honors students." The committee supports the APS Report recommendation that university resources be budgeted to increase recruiting efforts, to support increased workload related to the honors classroom experience, and to support increased advising responsibilities. The committee notes that while top scholars are not at-risk for academic failure, the APS Report data shows that many top students do not end up graduating from Wright State University.

Expansion of opportunities for top scholars should support the goal of making Wright State University the school of choice for graduation of these outstanding students.

## Be It Resolved that:

The Administration shall work with the faculty/staff of the Honors Program to expand the funding of the honors program to provide more opportunities for students to participate in the program. Issues that cause qualified students to not graduate with Honors (such as limited offerings of honors courses) shall be identified and addressed.

## Recommended for future development

This section of the report contains recommendations that the committee feels are worthy of consideration, but that have less impact or require more lead time than the recommendations in the previous section.

## Recommendation \#11: Freshman seminars and learning communities [APS Report, page 21]

Many universities have experienced success with first-year experience programs supported by freshman seminars or cohort-based learning communities. The APS Report does not provide data regarding the effectiveness of our freshman seminars, but the general consensus is that there is considerable room for improvement. The focus of the redesigned courses should include not only strategies for academic success, but become increasingly focused on shared intellectual experiences. This will require increased faculty participation in the first-year experience.

In the short-term, the committee recommends that first-year seminars continue to be offered through University College. The curriculum of the UVC semester course should be developed by the UVC curriculum committee. Periodic college-wide seminars where a member of the college faculty or invited speakers gives a presentation appropriate to firstyear students in the college may serve as a means to provide a worthwhile shared experience. Preparation for and discussion of these periodic seminars could serve as an intellectual focus for a portion of the small group experiences. Ideally, at least one seminar each year would be an invited speaker dealing with a contemporary issue of crossdisciplinary interest that could intellectually engage the entire student community. In the long-term, the first year experience may need to be redesigned and housed in the Academic Colleges.

## Be It Resolved that:

The Executive Committee of the Faculty Senate charge (or create) a committee(s) to plan, develop, monitor, and improve the effectiveness of freshman seminars and learning communities.

## Recommendation \#12: Enhanced scholarly and co-curricular activities [APS Report, page 28]

"The University should develop a three-year plan to increase opportunities for students to engage in service learning, community engagement, and undergraduate research in cooperation with the coordinators of these programs of the academic colleges" [APS Report, page 28-29]. The committee supports this recommendation, urging that the faculty from the academic colleges be included in all stages of the development of the plan.

## Be It Resolved that:

The Executive Committee of the Faculty Senate shall work with the administration to charge (or create) a committee to develop a three-year plan to increase opportunities for students to engage in service learning, community engagement, and undergraduate research in cooperation with the coordinators of these programs of the academic colleges.

## Recommendation \#13: Proactive intervention for at-risk students [APS Report, pages 23-24]

The APS Report recommends that faculty of courses critical to first-year success make available to academic advisors immediate access to student grades and attendance data so that intervention can take place well before course completion. This goal first requires the identification of critical first-year and general education courses. Secondly, this goal requires that the faculty of such courses be encouraged to enter this data into a common electronic format (such as Pilot) in a timely fashion. This may require investment into technologies to ease the collection and maintenance of such data directly into an electronic format, such as response clickers, electronic card-swipe or RFID readers for classrooms, or the like.

The committee supports this recommendation in principle but notes that there must remain room for significant variation in assessment both by course and by instructor. There is no "one tool fits all" solution to this problem. Participation in this recommendation must be completely voluntary; faculty must have the freedom to choose to use them-or not. A pilot study of the effectiveness of this approach on some sections of one or more critical courses should be considered before applying this approach more generally.

## Be It Resolved that:

University College allocate resources to Fall 2012 pilot for proactive intervention for at-risk students in one or more courses student to critical success and report to the Faculty Senate in Spring 2013 on the effectiveness of these techniques.

## Actions requiring significant revision or further planning

This section of the report contains recommendations that the committee feels that, while potentially worthwhile, require significant revision, planning, or study before adoption.

## Recommendation \#14: Streamlining mathematics remediation [APS Report, page 28]

As noted in Recommendation \#4, the committee supports the goal of providing means for students to be able to complete all remediation in a single semester. The APS Report recommends that the Mathematics Department consider the feasibility of both mathemporium software-based remediation and concurrent co-requisite stretch remediation courses that allow just-in-time remediation in parallel with immediate entry into nonremedial first-year Mathematics courses including College Algebra and Math and the Modern World.

The committee supports the recommendation that Mathematics Department investigate multiple paths for first-year success. This recommendation requires significant development before deployment, but seems, in theory, sound. Some members also suggested different remedial approaches for liberal arts majors, or engineering and science majors.

The committee recommends that the University allocate resources for a pilot program for a math emporium based approach to remedial/developmental mathematics education. We recommend that University College/UVC Curriculum committee work with the Mathematics Department to develop and fund a pilot program, to develop an implementation timeline, and to identify registration/financial aid issues unique to individualized learning paths and progress rate.

## Be It Resolved that:

University College and the Mathematics Department shall develop multiple one-semester remediation paths for conditionally admitted students with mathematics deficiencies. These paths should include individual (software-based) remediation, co-requisite stretch remediation, and more traditional remediation. These multiple paths should be evaluated over the next several years for their effectiveness in preparing students to succeed in their university mathematics requirements.

Recommendation \#15: Enhancing success for minority students [APS Report, page 33]
The APS Report recommends that "Enrollment Management, in collaboration with the academic colleges, should develop an aggressive plan to recruit minority students with ACT scores of 22 or more and high school GPAs of 3.2 or above" [APS Report, page 33]. The APS Report recommends that this recruitment should include financial aid packages "more than competitive" with other local institutions.

The committee supports the goal of making Wright State the school of choice for all qualified students in the Dayton region. The committee supports Wright State building relationships with area high schools to increase the number of qualified local students coming to Wright State. The committee feels that resources should be allocated to programs that work with area High Schools to increase the number of qualified minority (and nonminority) students (students who do not require significant remedial coursework).

The committee has concerns with committing competitive scholarship dollars to topperforming minority students only. Other local institutions (such as University of Dayton and Miami University) offer substantial financial aid packages to top-performing minority students, making it difficult to compete without dedicating substantial resources. These local top minority students will succeed - the only question is where they will succeed. The committee feels that spending these dollars better preparing local students who might otherwise not succeed may be a better allocation of resources.

## Be It Resolved that:

The Executive Committee of the Faculty Senate shall work with the administration to charge (or create) a committee to develop a three-year plan to increase the preparedness of students from local area high schools to enter Wright State University. Particular attention should be paid to institutions with a history of producing underprepared students.


[^0]:    HPS minor (assuming 3 credit hours per course):
    1 Required Course ( 3 hrs ): ONE from:
    PHL 2230 Symbolic Logic I
    PHL 3230 Symbolic Logic II
    PHL 4710 Philosophy of Science
    PHL 2150 Inductive Logic
    5 Electives ( 15 hrs .) All advanced courses $\mathbf{3 0 0 0}$ or higher: FIVE FROM
    PHL 3510 Scientific Revolutions
    PHL 3990 Space and Time
    PHL 3990 Kant's Critique of Pure Reason
    PHL 3990 Rationalism and Empiricism
    PHL 3990 Philosophy and Modern Physics
    PHL 3670 Philosophy of Mind
    PHL 3780 Bioethics
    PHL 3990 Causation and Causal Inference
    PHL 3990 Philosophy of Mathematics
    PHL 4240 Philosophy of Language and Logic
    PHL 3990 Philosophy of Biology/ Evolution
    PHL 4810 Advanced Study in HPS
    PHL/CLS 3990 Ancient Science
    PHL/HIS 3990 History of Science and Technology (STS)
    And 1 additional course for non-science majors, either a lab science course ( 4 Cr ) or a math course ( 200 level or above)

[^1]:    ${ }^{1}$ Austin, J. (2010). Creating an Academy of Learning: Authentic Assessment, Peer Review, and the College and Work Readiness Assessment. Independent School, 69(3).
    ${ }^{2}$ S. Bowles and H. Gintis, Schooling in Capitalist America: Educational Reform and the Contradictions of Economic Life (New York: Basic Books, Inc., 1976); S. Bowles and H. Gintis, "The Inheritance of Inequality," Journal of Economic Perspectives 16 (2002): 3-30; Farkas, "Racial Disparities and Discrimination in Education" (see note 13); J. Heckman and A. B. Krueger, Inequality in America: What Role for Human Capital Policies (MIT Press, 2003).

[^2]:    ${ }^{3}$ Roderick, M., Nagaoka, J., \& Coca, V., 2009. College readiness for all: The challenge for urban high schools. The Future of Children, 19:1.

[^3]:    ${ }^{1}$ Hughes, K., Scott-Clayton, J., 2011. Assessing developmental assessment in community colleges. Community College Research Center, February, 2011, CCRC Working Paper No. 19.
    ${ }^{2}$ The College Board does not provide or support concordances for Accuplacer. This concordance is from the Southern West Virginia Community and Technical College.

[^4]:    ${ }^{3}$ http://regents.ohio.gov/perfrpt/hs 2008/hs trans HS rpt AU08.pdf.

[^5]:    ${ }^{4}$ The College Board does not provide or support concordances for Accuplacer. This concordance is from the Southern West Virginia Community and Technical College.

[^6]:    ${ }^{5}$ Austin, J. (2010). Creating an Academy of Learning: Authentic Assessment, Peer Review, and the College and Work Readiness Assessment. Independent School, 69(3).
    ${ }^{6}$ S. Bowles and H. Gintis, Schooling in Capitalist America: Educational Reform and the Contradictions of Economic Life (New York: Basic Books, Inc., 1976); S. Bowles and H. Gintis, "The Inheritance of Inequality," Journal of Economic Perspectives 16 (2002): 3-30; Farkas, "Racial Disparities and Discrimination in Education" (see note 13); J. Heckman and A. B. Krueger, Inequality in America: What Role for Human Capital Policies (MIT Press, 2003).

[^7]:    ${ }^{7}$ Roderick, M., Nagaoka, J., \& Coca, V., 2009. College readiness for all: The challenge for urban high schools. The Future of Children, 19:1.

