

Course Discipline Code & No: BIO 228 Title: Biology of Plants Effective Term _____
 Division Code: MNBS Department Code: LIF Org #: 12100
 Don't publish: College Catalog Time Schedule Web Page

Reason for Submission. Check all that apply.
 New course approval Reactivation of inactive course
 Three-year syllabus review/Assessment report Inactivation (Submit this page only.)
 Course change

Change information: Note all changes that are being made. Form applies only to changes noted.

Consultation with all departments affected by this course is required. Total Contact Hours (total contact hours were: _____)
 Course discipline code & number (was _____)* Distribution of contact hours (contact hours were: _____)
 *Must submit inactivation form for previous course. lecture: _____ lab _____ clinical _____ other _____
 Course title (was _____) Pre-requisite, co-requisite, or enrollment restrictions
 Course description Change in Grading Method
 Course objectives (minor changes) Outcomes/Assessment
 Credit hours (credits were: _____) Objectives/Evaluation
 Other _____

Rationale for course or course change. Attach course assessment report for existing courses that are being changed.

Approvals Department and divisional signatures indicate that all departments affected by the course have been consulted.

Department Review by Chairperson New resources needed All relevant departments consulted

Print: Bradley R. Metz Faculty/Preparer Signature: [Signature] Date: 12/18/08
 Print: William B. Nevers Department Chair Signature: [Signature] Date: 12/18/08

Division Review by Dean
 Request for conditional approval
 Recommendation Yes No M. Showalter 12/18/08
 Dean's/Administrator's Signature Date

Curriculum Committee Review
 Recommendation Tabled Yes No [Signature] 2/5/09
 Curriculum Committee Chair's Signature Date

Vice President for Instruction Approval
[Signature] 2/10/09
 Vice President's Signature Date

Approval Yes No Conditional

Do not write in shaded area.
 Log File 12/23/08 Ecopy Banner 2/19 C&A Database 2/19 C&A Log File 2/19/09 Basic skills Contact fee

Please return completed form to the Office of Curriculum & Assessment and email an electronic copy to sjohn@wccnet.edu for posting on the website.

***Complete ALL sections which apply to the course, even if changes are not being made.**

Course: Biology 228	Course title: Biology of Plants
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Credit hours: <u>4</u> If variable credit, give range: _____ to _____ credits	Contact hours per semester: <table style="width:100%; border-collapse: collapse;"> <tr> <td></td> <td style="text-align: center;"><u>Student</u></td> <td style="text-align: center;"><u>Instructor</u></td> </tr> <tr> <td>Lecture:</td> <td style="text-align: center;">_45_</td> <td style="text-align: center;">45</td> </tr> <tr> <td>Lab:</td> <td style="text-align: center;">_45_</td> <td style="text-align: center;">45</td> </tr> <tr> <td>Clinical:</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>Practicum:</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>Other:</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>Totals:</td> <td style="text-align: center;"><u>90</u></td> <td style="text-align: center;"><u>90</u></td> </tr> </table>		<u>Student</u>	<u>Instructor</u>	Lecture:	_45_	45	Lab:	_45_	45	Clinical:	_____	_____	Practicum:	_____	_____	Other:	_____	_____	Totals:	<u>90</u>	<u>90</u>	Are lectures, labs, or clinicals offered as separate sections? <input type="checkbox"/> Yes - lectures, labs, or clinicals are offered in separate sections <input checked="" type="checkbox"/> No - lectures, labs, or clinicals are offered in the same section	Grading options: <input type="checkbox"/> P/NP (limited to clinical & practica) <input type="checkbox"/> S/U (for courses numbered below 100) <input checked="" type="checkbox"/> Letter grades
	<u>Student</u>	<u>Instructor</u>																						
Lecture:	_45_	45																						
Lab:	_45_	45																						
Clinical:	_____	_____																						
Practicum:	_____	_____																						
Other:	_____	_____																						
Totals:	<u>90</u>	<u>90</u>																						

Prerequisites. Select one:

College-level Reading & Writing
 Reduced Reading/Writing Scores
 (Add information at Level I prerequisite)
 No Basic Skills Prerequisite
 (College-level Reading and Writing is not required.)

In addition to Basic Skills in Reading/Writing:

Level I (enforced in Banner)

Course	Grade	Test	Min. Score	Concurrent Enrollment <small>(Can be taken together)</small>	Corequisites <small>Must be enrolled in this class also during the same semester</small>
Biology 101 or 102	C	_____	_____	<input type="checkbox"/>	_____
<input type="checkbox"/> and <input type="checkbox"/> or _____	_____	_____	_____	<input type="checkbox"/>	_____
<input type="checkbox"/> and <input type="checkbox"/> or _____	_____	_____	_____	<input type="checkbox"/>	_____
<input type="checkbox"/> and <input type="checkbox"/> or _____	_____	_____	_____	<input type="checkbox"/>	_____

Level II (enforced by instructor on first day of class)

Course	Grade	Test	Min. Score
_____	_____	_____	_____
_____	_____	_____	_____

Enrollment restrictions (In addition to prerequisites, if applicable.)

and or Consent required
 and or Admission to program required
 and or Other (please specify): _____
 Program: _____

Please send syllabus for transfer evaluation to:
 Conditionally approved courses are not sent for evaluation.
 Insert course number and title you wish the course to transfer as.

<input type="checkbox"/> E.M.U. as _____	<input type="checkbox"/> _____ as _____
<input type="checkbox"/> U of M as _____	<input type="checkbox"/> _____ as _____
<input type="checkbox"/> _____ as _____	<input type="checkbox"/> _____ as _____

<p>Course Biology 228</p>	<p>Course title Biology of Plants</p>	
<p>Course description State the purpose and content of the course. Please limit to <u>500</u> characters.</p>	<p>This course introduces plant biology as a field of study and covers major topics, including; plant biochemistry, plant structure and function, plant growth, nutrition and regulation, plant evolution and classification of the major divisions focusing on flowering plants. The laboratory component emphasizes and complements the lectures while focusing on plant cells, structure and function, photosynthesis, flowers, fruits and seeds and growth and development through a typical plant life cycle.</p>	
<p>Course outcomes List skills and knowledge students will have after taking the course. Assessment method Indicate how student achievement in each outcome will be assessed to determine student achievement for purposes of course improvement.</p>	<p>Outcomes (applicable in all sections)</p> <ol style="list-style-type: none"> 1. Identify and describe the cells, tissues and organs of the plant kingdom. 2. Describe the processes of transport, metabolism and growth in the plant kingdom. 3. Describe plant genetics as it relates to alternation of generations, plant propagation and evolution. 4. Describe the similarities and differences in form and function in the photosynthetic kingdoms. 	<p>Assessment Methods for determining course effectiveness</p> <ol style="list-style-type: none"> 1. Labeling diagrams and written questions on the unit exam. 2. Written questions on the unit exam. 3. Written questions on the unit exam. 4. Written questions on the unit exam.
<p>Course Objectives Indicate the objectives that support the course outcomes given above. Course Evaluations Indicate how instructors will determine the degree to which each objective is met for each student.</p>	<p>Objectives (applicable in all sections)</p> <ol style="list-style-type: none"> 1. Identify and describe the cells, tissues and organs of the plant kingdom. <ol style="list-style-type: none"> a. Describe how humans have impacted the environment. b. Describe the scientific method. c. Explain why life depends upon green organisms. d. Identify the attributes of living organisms. e. Describe the basic forms of energy. f. Know the chemical characteristics of the 4 major elements of cells. g. Define the function of carbohydrates, lipids, proteins and nucleic acids. h. Describe the cell theory. i. Explain and identify the structures and organelles of plant cells. j. Describe the cell cycle and each stage of mitosis. k. Identify and describe the meristems of plants. l. Describe the conducting tissues of plants. m. Describe/identify plant tissues. n. Describe the structure, function and forms of roots. o. Identify the differences in modified roots. p. Describe the aspects of productive soil. q. Describe soil particles as it relates to water and availability of water. r. Describe the tissues and specialized structures 	<p>Evaluation Methods for determining level of student performance of objectives</p> <ol style="list-style-type: none"> 1. Short answer, fill-in and essay questions on the unit exam.

	<p>of stems.</p> <ul style="list-style-type: none"> s. Compare and contrast herbaceous stems with woody stems. t. Identify/describe specialized stems. u. Describe the internal and external structure of a leaf. v. Describe plant leaves using botanical definitions. w. Identify/describe specialized leaves. x. Describe leaf abscission. y. Identify and describe the function of floral anatomy. z. Describe the differences between monocots and dicots. aa. Identify the regions of mature fruits. bb. Describe the different types of fruits. cc. Describe fruit/seed adaptations for seed dispersal. dd. Describe the parts of a monocot and dicot seed. ee. Describe dormancy and germination and the factors that influence both. ff. <p>2. Describe the processes of transport, metabolism and growth in the plant kingdom.</p> <ul style="list-style-type: none"> a. Describe diffusion, osmosis, turgor, imbibitions and active transport. b. Describe the pressure flow hypothesis and the cohesion tension theory. c. Describe the pathway and use of water in plants. d. Describe adaptations to control water loss. e. Know the major mineral requirements for plant growth. f. Describe the major reactions of cellular respiration and photosynthesis. g. Describe the benefits to alternate methods of photosynthesis. h. Contrast growth, differentiation and development. i. Distinguish between nutrients, vitamins and hormones. j. Describe the different types of plant movements and the forces behind them. k. Describe the function of phytochromes. l. Identify the function of temperature in plant growth. m. Describe dormancy and stratification. <p>3. Describe plant genetics as it relates to alternation of generations, plant propagation and evolution.</p> <ul style="list-style-type: none"> a. Describe the phases of meiosis. b. Compare and contrast mitosis and meiosis. c. Explain the significance of crossing over to offspring. d. Describe an alternation of generations. 	<p>2. Short answer, fill-in and essay questions on the unit exam.</p> <p>3. Short answer, fill-in and essay questions on the unit exam.</p>
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	<ul style="list-style-type: none"> e. Describe the structure and function of DNA. f. Describe the process of DNA replication. g. Describe transcription and translation. h. Contrast aneuploids and polyploids. i. Perform Punnett square analysis of monohybrid and dihybrid crosses. j. Compare and contrast genotype and phenotype. k. Describe extranuclear DNA. l. Explain linked genes and their effect on inheritance. m. Describe human selection as it relates to crops and agriculture. n. Describe plant breeding methods of self and cross-pollinating varieties. o. Describe protoplast fusion. p. Outline the major steps involved in creating a transgenic plant. q. Describe the process of grafting, cuttings and micropropagation. r. Summarize early developments in evolution. s. Describe the contributions of Charles Darwin to the theory of evolution and natural selection. t. Describe the various lines of evidence for evolution. u. Explain the significance of mutation, migration, genetic drift and isolation to evolution. <p>4. Describe the similarities and differences in form and function in the photosynthetic kingdoms.</p> <ul style="list-style-type: none"> a. Compare and contrast the different autotrophic bacteria. b. Compare and contrast the different major groups of photosynthetic protists. c. Describe why protists are not plants. d. Describe the economic impact of photosynthetic protists. e. Describe the features of the Plant Kingdom. f. Explain how Bryophytes differ from other plant groups. g. Describe the life cycle of a typical moss. h. Compare and contrast the sporophytic differences between liverworts, hornworts and mosses. i. Describe the structural differences between bryophytes and vascular plants. j. Compare and contrast the 4 phyla of seedless vascular plants. k. Describe the alternation of generations in a fern. l. Describe the features of pollen and seed cones in the Conifers. m. Compare and contrast the phyla of living gymnosperms. n. Describe the leaf modifications of a pine. o. Describe the life cycle of a typical pine. p. Describe specialized cells and tissues in the gymnosperms. 	<p>4. Short answer, fill-in and essay questions on the unit exam.</p>
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MASTER SYLLABUS

	q. Compare and contrast gymnosperms and angiosperms. r. Describe the schools of thought on the origin of flowering plants. s. Explain the alternation of generations in a typical angiosperm. t. Explain the adaptations of flowers for specific pollinators. u. Describe the major trends in specialization in flowering plants.	
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List all new resources needed for course, including library materials.

Student Materials:

List examples of types Texts Supplemental reading Supplies Uniforms Equipment Tools Software	Introductory Plant Biology. Stern Bidlack and Jansky	Estimated costs \$ 100
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Equipment/Facilities: Check all that apply. (All classrooms have overhead projectors and permanent screens.)

Check level only if the specified equipment is needed for all sections of a course.

<input type="checkbox"/> Level I classroom Permanent screen & overhead projector <input type="checkbox"/> Level II classroom Level I equipment plus TV/VCR X Level III classroom Level II equipment plus data projector, computer, faculty workstation	<input type="checkbox"/> Off-Campus Sites <input type="checkbox"/> Testing Center <input type="checkbox"/> Computer workstations/lab <input type="checkbox"/> ITV <input type="checkbox"/> TV/VCR <input type="checkbox"/> Data projector/computer <input type="checkbox"/> Other _____
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Assessment plan:

Learning outcomes to be assessed (list from Page 3)	Assessment tool	When assessment will take place (semester & year)	Course section(s)/other population	Number students to be assessed
1. Identify and describe the cells, tissues and organs of the plant kingdom.	1. Labeling diagrams and written questions on the unit exam.	Fall 2011 and every 3 years	All sections	100%
2. Describe the processes of transport, metabolism and growth in the plant kingdom.	2. Written questions on the unit exam.	Fall 2011 and every 3 years	All sections	100%
3. Describe plant genetics as it relates to alternation of generations, plant propagation and evolution.	3. Written questions on the unit exam.	Fall 2011 and every 3 years	All sections	100%
4. Describe the similarities and differences in form and function in the photosynthetic kingdoms.	4. Written questions on the unit exam.	Fall 2011 and every 3 years	All sections	

Scoring and analysis of assessment:

1. Indicate how the above assessment(s) will be scored and evaluated (e.g. departmentally developed rubric, external evaluation, other). Attach the rubric/scoring guide.

For all outcomes: A set of 20 questions, 5 from each exam will be scored and evaluated by the department.

2. Indicate the standard of success to be used for this assessment.

For all outcomes: The set of questions from each unit exam will be assessed. The class average will be calculated with a minimum standard of success of 70%

3. Indicate who will score and analyze the data (data must be blind-scored).

Instructors of Biology 228 will score the results and submit them to the appropriate faculty member, who will analyze the collected data.

4. Explain the process for using assessment data to improve the course.

The assessment data collected will provide information for syllabus review for the department and provide information to faculty about outcomes that do not meet the standard of success. Outcomes that do not meet the standard of success will be open to review, revision and the application of other pedagogical approaches.