CGS Agenda Item: 16-48
Effective Fall 2017

Eastern Illinois University
New Course Proposal
CIT 4803, Operating Systems for Computer Technology

Banner/Catalog Information (Coversheet)

1. **_X_ New Course or _____Revision of Existing Course**
2. **Course prefix and number:** CIT 4803
3. **Short title:** _____Operating Systems_____
4. **Long title:** _____Operating Systems for Computer Technology_____
5. **Hours per week:** __2_ Class _2__ Lab _3__ Credit
6. **Terms:** __ Fall ___ Spring ___ Summer __X_ On demand
7. **Initial term**: _X__ Fall ___ Spring ___ Summer Year: _2017
8. **Catalog course description:** An introduction to technological applications of modern operating systems: Design concepts, data structures, algorithms and systems (shell) programming basics. Emphasis will be on UNIX, LINUX and WINDOWS based operating systems.
9. **Course attributes: N/A**

   General education component: _____N/A_____

   ___ Cultural diversity ___ Honors ___ Writing centered ___ writing intensive ___Writing active
10. **Instructional delivery**
    Type of Course:

    ___ Lecture ___ Lab _X__ Lecture/lab combined ___ Independent study/research

    ___ Internship ___ Performance ___ Practicum/clinical ___ Other, specify: _____

    Mode(s) of Delivery:

    _X_ Face to Face __ online ___ Study Abroad

    _X_ Hybrid, specify approximate amount of on-line and face-to-face instruction 30% Face-to-face and 70% online
11. Course(s) to be deleted from the catalog once this course is approved. ___NONE__
12. **Equivalent course(s):** _____NONE_____

    a. **Are students allowed to take equivalent course(s) for credit?** ___ Yes _X_ No
13. **Prerequisite(s): ___AET 3163 _____**

    a. **Can prerequisite be taken concurrently?** _X__ Yes _ No

    b. Minimum grade required for the prerequisite course(s)? _C__

    c. **Use Banner coding to enforce prerequisite course(s)?** _X_ Yes ___ No

d. **Who may waive prerequisite(s)?**

___ No one _X__ Chair __ Instructor ___ Advisor ___ other (specify)

14. Co-requisite(s): __NONE_____

15. Enrollment restrictions

a. **Degrees, colleges, majors, levels, classes which <u>may</u> take the course:** _ Completion of 75 hours of coursework in a CIT, AET, or MIS major; or a graduate student.

b. **Degrees, colleges, majors, levels, classes which may <u>not</u> take the course:** _ALL others____

16. Repeat status: _X__ May not be repeated __ May be repeated once with credit

17. Enter the limit, if any, on hours which may be applied to a major or minor: ___

18. Grading methods: _X_ Standard ___ CR/NC __ Audit ___ ABC/NC

19. Special grading provisions:

___ Grade for course will <u>not</u> count in a student's grade point average.

___ Grade for course will <u>not</u> count in hours toward graduation.

___ Grade for course will be removed from GPA if student already has credit for or is registered in: _____

___ Credit hours for course will be removed from student's hours toward graduation if student already has credit for or is registered in: _____

20. Additional costs to students:
Supplemental Materials or Software_____

Course Fee _X_ No ___Yes, Explain if yes_____

21. Community college transfer:

__ A community college course may be judged equivalent.

_X__ A community college may <u>not</u> be judged equivalent.

Note: Upper division credit (3000+) will <u>not</u> be granted for a community college course, even if the content is judged to be equivalent.

Rationale, Justifications, and Assurances (Part I)

1. X Course is required for the major(s) of Computer and Information Technology
   ___Course is required for the minor(s) of _____
   ___Course is required for the certificate program(s) of _____
   ___ Course is used as an elective
2. **Rationale for proposal:** A new Major in Computer Technology will be offered starting Fall 2017, this course is part of the new core courses in this cluster area.

3. **Justifications for (answer N/A if not applicable)**
   Similarity to other courses: None
   Prerequisites: AET 3163. Students needs to know the core of computer programming to better understand /apply operating system applications and concepts.
   Co-requisites:
   Enrollment restrictions: Senior or upper junior AET, MIS and CIT students only. Students in these majors have the necessary background to successfully pass this course.
   Writing active, intensive, centered: N/A

4. **General education assurances (answer N/A if not applicable)**
   General education component: N/A
   Curriculum: N/A Instruction: N/A Assessment: N/A

5. **Online/Hybrid delivery justification & assurances (answer N/A if not applicable))**
   Online or hybrid delivery justification: *The content and structure for this course relies upon independent research, in-depth group discussion, and video based lecture. As compared to many lab courses already offered in technology area, this course requires online delivery of lecture and discussion and face-to-face lab activities for applied projects. For content delivered online, the course employs online video presentations, structured web discussions focused on reading assignments, and linked to articles submitted to the instructor. Students are required to draw on research and review of articles to discuss and develop fundamental procedural knowledge of application. Discussions invite students to explore in more detail the required knowledge and procedures to create various web publishing tools and media. Discussions and examinations will be administered and submitted via the online course management tool. Three years ago this course would have been impossible to be delivered*

online. Since then, several video tools are now available for editing and manipulation. Many software design companies have made their software tools more readily accessible for students. The Internet connection speed for many users has increased thereby allowing for higher quality rich media instruction to be delivered. Finally, the course management tools that the university now uses allows there to be a richer interaction between students and faculty. To accommodate this situation, many of the given activities may be completed in a hybrid format.

Instruction: *This course employs instructor led online presentations, student reading assignments, student applied design assignments, peer critique and troubleshooting, student presentations, and examinations. After reviewing the instructor led presentations and completing the student reading assignments, students will be required to draw on what they have read and then to apply it to a context of creating graphics for personal or organizational applications. While working on these projects, students may engage in the activity of troubleshooting or critique while posting their work in an online discussion board for both classmates and the instructor to provide feedback and guidance. Presentations will provide learners a forum to share the results of their work and receive further feedback. Reading assignments, applied projects, and examinations will be administered, collected, and/or submitted via the online course management tool. Presentations may also be delivered in the course tool or face-to-face. All faculty who will deliver this course online are/will be OCDi (or appropriate equivalent) trained.*

Integrity: *Work submitted online, such as discussions and examinations, will be substantiated via learners providing citation in APA format and submitting related articles to quantify work. Further, the length, frequency, quality, and integrity of discussion posts can be monitored via the online course management tool. Examinations will require the same of learners and additionally will use software tools to check work for the integrity and authenticity of submitted assignments. The examinations will be time restricted and of sufficient length to prohibit consultation of unauthorized sources. Work submitted face-to-face in applied lab projects will be checked for authenticity via the individualized nature of project completion. Requirements for projects will require learners to engage in activities that require creation of original content for either themselves or local entity.*

Interaction: *For online content, the course employs email, web-based discussions, exploration of off-site Internet resources, web-based presentations, web chat rooms and lab based applied project work. The instructor will communicate with students through the online discussion board and web-based discussions. Email may also be a tool used for the instructor to communicate with an individual student or to post course announcements. The learners for this course may also communicate with one another for these tools. During digital office hours, the instructor will remain available for discussion during certain times and communicate using a chat room tool in the learning management system. For face-to-face interaction, the instructor may communicate synchronously with the learners during open lab activities and during office hours. The learners are also free to communicate with other learners during lab activities.*

Model Syllabus (Part II)

Please include the following information:

1. Course number and title: CIT 4803, "Operating Systems for Computer Technology"

2. Catalog description

"An introduction to technological applications of modern operating systems: Design concepts, data structures, algorithms and systems (shell) programming basics. Emphasis will be on UNIX, LINUX and WINDOWS based operating systems"

3. Learning objectives.

At the end of this course student will be able to:

1. Describe basic operating system functions like threads, context switching, synchronization, scheduling, message passing and deadlocks. (WR 1-5, QR 1-3, Grad 3)
2. Apply operating system design to memory management, linking, dynamic memory allocation, dynamic address translation, virtual memory, and demand paging. (CT 1-5, WR 1-4, QR 1-4, Grad 1, 2, 3)
3. Analyze issues related to file systems, including topics such as storage devices, distributed operating systems, disk management and scheduling, directories, protection, and crash recovery. (CT1-5, WR 1-4, QR 1-3, Grad 1, 2, 3)
4. Design and describe an operating system or subsystem in an integrated final project (CT1-5, WR1-7, SL1-3, RC 1-3, Grad 1, 2, 3, 4)

GRADUATE LEARNING GOALS

Objective	Depth of Content knowledge	Critical thinking and problem solving	Oral and/or written communication	Advance scholarship through research and creative activity
1			X	
2	X	X	X	
3	X	X	X	
4	X	X	X	X

UNDERGRADUATE LEARNING GOALS

Objective	Speaking and Listening	Critical Thinking	Writing and Critical Reading	Quantitative Reasoning	Responsible Citizenship
1			X	X	
2		X	X	X	
3		X	X	X	X
4	X	X	X	X	

4. Course materials.

Textbook: Operating systems: a concept-based approach / Dhananjay M. Dhamdhere. McGraw Hill 2012

5. Weekly outline of content. (Face-to-Face Modality)

Meeting day (TH)	TOPICS	ACTIVITIES
Week 1	1. Introduction 2. The OS, the Computer, and User Programs	- HW 1
Week 2	3. Overview of Operating Systems 4. Structure of Operating Systems	- LAB 1
Week 3	5. Processes and Threads	- HW 2
Week 4	6. Process Synchronization	- LAB 2
Week 5	7. Scheduling 8. Deadlocks	- MIDTERM 1
Week 6	9. Message Passing	- HW 3
Week 7	10. Synchronization and Scheduling in Multiprocessor Operating Systems	- LAB 3
Week 8	11. Memory Management 12. Virtual Memory	- HW 4
Week 9	13. File Systems	- LAB 4
Week 10	14. Implementation of File Operations	- MIDTERM 2
Week 11	15. Security and Protection	- HW 5
Week 12	16.Distributed Operating Systems	- LAB 5
Week 13	17. Recovery and Fault Tolerance	- HW 6
Week 14	18. Distributed File Systems	- LAB 6
Week 15	Final Project	Final Project Advice
Week 16	Final Project	Final Project Advice

Weekly outline of content (Hybrid Modality)

Meeting day (TH)	TOPICS	ACTIVITIES
Week 1	1. Introduction 2. The OS, the Computer, and User Programs	
Week 2	3. Overview of Operating Systems 4. Structure of Operating Systems	- HW 1
Week 3 :	5. Processes and Threads	- HW 2
Week 4: Face to Face meeting 8 am– 2 p.m.	Q & A/ Review For Weeks 1-3 6. Process Synchronization 7.Scheduling	- LAB 1 - LAB 2
Week 5	8. Deadlocks	- MIDTERM 1
Week 6	9. Message Passing	
Week 7:	10. Synchronization and Scheduling in Multiprocessor Operating Systems	- HW 3
Week 8: Face to Face meeting 8 am -2 p.m.	Q&A/ Review for weeks 5-7 11. Memory Management 12. Virtual Memory	- LAB 3 - LAB 4
Week 9	13. File Systems	
Week 10	14. Implementation of File Operations	- HW 4
Week 11	15. Security and Protection	- HW 5
Week 12: Face to Face meeting 8 am -2 p.m.	Q & A / Review for weeks 9-11 16.Distributed Operating Systems	-LAB 5 -LAB 6
Week 13	17. Recovery and Fault Tolerance	-MIDTERM 2
Week 14	18. Distributed File Systems	- HW 6
Week 15:	Final Project	
Week 16: Face to face Meeting 8- noon	Q & A weeks 13-15 Final project presentations	

6. Assignments and evaluation, including weights for final course grade.

	UNDERGRADUATE	GRADUATE
- 2 "MIDTERMS"	250 points	250 Points
- Laboratories	300 points	250 Points
- HOMEWORK	300 points	300 Points
- Final Project (In lieu of Final Exam)	150 points	200 Points
TOTAL	1000 Points	1000 Points

7. Grading scale.

The final grade will be assigned based on the total points "X" earned as follows:

$X \geq 901$: A; $801 \leq X \leq 900$: B; $701 \leq X \leq 800$: C $601 \leq X \leq 700$: D; $X \leq 600$: F

8. Correlation of learning objectives to assignments and evaluation

Objective	Laboratories	HW Assignments	MIDTERMS	Final Project
1. Describe basic operating system functions like threads, context switching, synchronization, scheduling, message passing and deadlocks. (WR 1-5, QR 1-3, Grad 3)	Lab 1, Lab2 (10%)	HW1, HW2 (10%)	Midterm 1(12.5%)	X
2. Apply operating system design to memory management, linking, dynamic memory allocation, dynamic address translation, virtual memory, and demand paging. (CT 1-5, WR 1-4, QR 1-4, Grad 1, 2, 3)	Lab 3, Lab 4(10%)	HW 3, HW 4 (10%)	Midterm 2 (12.5%)	X
3. Analyze issues related to file systems, including topics such as storage devices, distributed operating systems, disk management and scheduling, directories, protection, and crash recovery. (CT1-5, WR 1-4, QR 1-3, Grad 1, 2, 3)	Lab 5, Lab 6(10%)	HW 5, HW 6 (10%)		X
4. Design and describe an operating				X (15%)

system or subsystem in an integrated final project (CT1-5, WR1-7, SL1-3, RC 1-3, Grad 1, 2, 3, 4)				

Date approved by the department or school: 2/16/16
Date approved by the college curriculum committee: 4/22/2016
Date approved by the Honors Council *(if this is an honors course):* Date approved by CAA: 4/28/2016 CGS: 5-3-16