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| utdbw83x35 | **Course** | **CS/SE 4348.502, Operating Systems Concepts** |
| **Professor** | Sridhar Alagar |
| **Term** | Fall 2018 |
| **Meetings** | TR 5:30 am – 6:45 pm, ECSN2.110 |

**Professor’s Contact Information**

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| **Office Phone** | (972) 883-4161 |
| **Other Phone** | (972) 883-2185 (CS Department Phone Number) |
| **Office Location** | ECS South 2.603 |
| **Email Address** | [sridhar@utdallas.edu](mailto:sridhar@utdallas.edu) |
| **Office Hours** | Tuesdays 4 pm to 5:15 pm, Wednesdays 4 pm to 5:15 pm, or any other suitable time through appointment |
| **Teaching Assistant** | TBA |

**General Course Information**

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| **Pre-requisites, Co-requisites, & other restrictions** | Pre-requisites: CS/SE/TE 3340 or equivalent, CS/SE 3377, CE/CS/SE/TE 3345 and a working knowledge of C and UNIX. *Programming skills in C/C++ and/or in Java, socket programming skills is preferable.* |
| **Course Description** | An introduction to fundamental concepts in operating systems: their design, implementation, and usage. Topics include process management, main memory management, virtual memory, I/O and device drivers, file systems, secondary storage management, and an introduction to critical sections and deadlocks. |
| **Learning Outcomes** | 1. An understanding of processes 2. An understanding of threads 3. An understanding of concurrent programs. 4. An understanding of simple memory management. 5. An understanding of virtual memory 6. An understanding of scheduling algorithms. 7. An understanding of I/O management 8. An understanding of file management. 9. An understanding of OS virtualization. |
| **Required Texts & Materials** | The text book (available for free at http://www.ostep.org):  **Operating Systems: Three Easy Pieces**  Remzi H. Arpaci-Dusseau and Andrea C. Arpaci-Dusseau  Arpaci-Dusseau Books  For projects, the following book is useful (available for free at https://pdos.csail.mit.edu/6.828/2017/xv6/book-rev10.pdf):  **xv6 - a simple, Unix-like teaching operating system**  Russ Cox, Frans Kaashoek, and Robert Morris |

**Assignments & Academic Calendar**

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| ***Week*** | ***Dates*** | ***Topic*** | ***Chapter Links*** | ***Projects*** |
| *1* | *Aug 21, 23* | *Introduction, Processes* | [*2*](http://pages.cs.wisc.edu/~remzi/OSTEP/intro.pdf)*,* [*4*](http://pages.cs.wisc.edu/~remzi/OSTEP/cpu-intro.pdf)*,* [*5*](http://pages.cs.wisc.edu/~remzi/OSTEP/cpu-api.pdf)*,* [*6*](http://pages.cs.wisc.edu/~remzi/OSTEP/cpu-mechanisms.pdf) | *P1* |
| *2* | *Aug 28, 30* | *CPU Scheduling* | [*7*](http://pages.cs.wisc.edu/~remzi/OSTEP/cpu-sched.pdf)*,* [*8*](http://pages.cs.wisc.edu/~remzi/OSTEP/cpu-sched-mlfq.pdf) |  |
| *3* | *Sep 04, 06* | *Mem. Mgmt, Paging* | [*13*](http://pages.cs.wisc.edu/~remzi/OSTEP/vm-intro.pdf)*,* [*15*](http://pages.cs.wisc.edu/~remzi/OSTEP/vm-mechanism.pdf)*,* [*16*](http://pages.cs.wisc.edu/~remzi/OSTEP/vm-segmentation.pdf) |  |
| *4* | *Sep 11, 13* | *Paging, P2 Discussion* | [*18*](http://pages.cs.wisc.edu/~remzi/OSTEP/vm-paging.pdf)*,* [*19*](http://pages.cs.wisc.edu/~remzi/OSTEP/vm-tlbs.pdf) | *P1 due, P2* |
| *5* | *Sep 18, 20* | *Paging, Beyond Physical* | [*20*](http://pages.cs.wisc.edu/~remzi/OSTEP/vm-smalltables.pdf)*,* [*21*](http://pages.cs.wisc.edu/~remzi/OSTEP/vm-beyondphys.pdf)*,* [*22*](http://pages.cs.wisc.edu/~remzi/OSTEP/vm-beyondphys-policy.pdf) |  |
| *6* | *Sep 25, 27* | *P3 Discussion, Threads, Locks* | [*26*](http://pages.cs.wisc.edu/~remzi/OSTEP/threads-intro.pdf)*,* [*27*](http://pages.cs.wisc.edu/~remzi/OSTEP/threads-api.pdf)*,* [*28*](http://pages.cs.wisc.edu/~remzi/OSTEP/threads-locks.pdf) | *P2 due, P3* |
| *7* | *Oct 2, 4* | *Locks, CVs* | [*29*](http://pages.cs.wisc.edu/~remzi/OSTEP/threads-locks-usage.pdf)*,* [*30*](http://pages.cs.wisc.edu/~remzi/OSTEP/threads-cv.pdf) |  |
| *8* | *Oct 9, 11* | *Review, Exam 1* |  |  |
| *9* | *Oct 16, 18* | *Semaphores* | [*31*](http://pages.cs.wisc.edu/~remzi/OSTEP/threads-sema.pdf) | *P3 due, P4* |
| *10* | *Oct 23, 25* | *Deadlocks, P4 discussion* | [*32*](http://pages.cs.wisc.edu/~remzi/OSTEP/threads-bugs.pdf) |  |
| *11* | *Oct 30, Nov 1* | *I/O, Disks* | [*36*](http://pages.cs.wisc.edu/~remzi/OSTEP/file-devices.pdf)*,* [*37*](http://pages.cs.wisc.edu/~remzi/OSTEP/file-disks.pdf) |  |
| *12* | *Nov 6, 8* | *File Systems, FFS* | [*39*](http://pages.cs.wisc.edu/~remzi/OSTEP/file-intro.pdf)*,* [*40*](http://pages.cs.wisc.edu/~remzi/OSTEP/file-implementation.pdf)*,* [*41*](http://pages.cs.wisc.edu/~remzi/OSTEP/file-ffs.pdf) | *P4 due, P5* |
| *13* | *Nov 13, 15* | *Journaling, P5 discussion* | [*42*](http://pages.cs.wisc.edu/~remzi/OSTEP/file-journaling.pdf) |  |
| *14* | *Nov 20, 22* | *Fall Break* |  |  |
| *15* | *Nov 27, 29* | *RAID, Virtualization* | [*38*](http://pages.cs.wisc.edu/~remzi/OSTEP/file-raid.pdf)*,* [*VM*](http://pages.cs.wisc.edu/~remzi/OSTEP/vmm-intro.pdf) | *P5 due* |
| *16* | *Dec 4, 6* | *Review, Exam 2* |  |  |

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| **Important Dates and Times** | * First day of class: *Tuesday, Aug 21st, 2018* * Exam 1: *Thursday, Oct 11, 2018* *(during class hours)* * Exam 2:  *Thursday, Dec 6 (during class hours)* |

**Course Policies**

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| **Grading Criteria** | Exam 1: 20%, Exam 2: 20%, Programming Projects: 60%  **All programming projects must be implemented only in C.**  Students may be asked to demonstrate their projects to the TA to receive a grade on them.  To pass the course, a student must pass separately in examinations and programming projects. To obtain an “A” or “A-” grade a student must perform above class average in the examinations, as well as above the class average in the programming projects. This is the minimum requirement, and satisfying this requirement does not guarantee an A or A- grade. |
| **Make-up Exams** | Make-up examinations will be offered only if the student has a valid medical reason and produces a doctor’s letter.  If a student has to be absent for several classes because of job related obligations, he/she will not be eligible for an incomplete grade. In such instances, the student is advised to drop the course. |
| **Extra Credit** | No extra credit work will be assigned. |
| **Late Work** | Programming projects submitted after the due date will be penalized at the rate of 10% of the total credit for that project for every day (not including weekends and holidays) by which they are late. Late submissions will not be accepted once the solution has been discussed in class and the graded submissions have been returned. |
| **Class Attendance** | Regular attendance is highly recommended. As per the Department of Computer Science policy, three consecutive absences lead to one letter grade drop. Four consecutive absences lead to a F.  <http://cs.utdallas.edu/education/undergraduate/attendance-policy/> |
| **Classroom Citizenship** | The instructor encourages students to take active part in class discussions. No question is too simple/stupid to be asked. So, do not hesitate.  Use of Laptops and smart phones for purposes other than related to class work is strictly prohibited. Sometimes, the instructor may insist that laptops be closed. |
| **Field Trip Policies** | Not applicable. |
| **UT Dallas Syllabus Policies and Procedures** | *The information contained in the following link constitutes the University’s policies and procedures segment of the course syllabus.*  *Please go to* [*http://go.utdallas.edu/syllabus-policies*](http://go.utdallas.edu/syllabus-policies) *for these policies.* |

***These descriptions and timelines are subject to change at the discretion of the Professor.***