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**Department of Mathematics**

**College of Basic education**

**University of Salahaddin -Hawler**

**Subject: Maple**

**Course Book –Year 3-Second course**

**Lecturer's name: PhD. Azad Ibrahim Amen**

**Academic Year: 2022/2023**

**Course Book**

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| **1. Course name** | **Maple** |
| **2. Lecturer in charge** |  |
| **3. Department/ College** | **Mathmatics-Basic Education** |
| **4. Contact** | **e-mail:azad.amen@su.edu.krd** |
| **5. Time (in hours) per week**  | **For example Theory: 3** |
| **6. Office hours** | **1 hours** |
| **7. Course code** |  |
| **8. Teacher's academic profile**  | Specialization Applied Mathematics /differential equations Bsc –Salahaddin University1988Msc-Baghdad university-1991PhD-Salahaddin university-2011Scientific Rank: Professor |
| **9. Keywords** | Programming in Maple, **Procedures** , loops ,conditional statement, **Lists** ,applications in mathematics. |
| **10. Course overview:**The purpose of this course is to give students knowledge in order to how they use Maple to write programing in mathematics, and teach them make programming for subjects related to applied mathematics.  |
| **11. Course objective:**Maple is a system for doing mathematics on a computer. Maple combines symbolic manipulation, numerical mathematics, outstanding graphics, and a sophisticated programming language. First, introductory programming classes often ignore the context in which programming is actually done. When the goal is to teach students how to write programs, the temptation is great to tell the students exactly what programs to write. Second, introductory programming classes are most often designed for students planning to major in computer science. |
| **12. Student's obligation*** **Questions on the exams**

will be drawn from homework, reading, and lectures. I also encourage youto ask questions and participate in class.* **Homework**: A list of homework problems will be given on the course web

page every few weeks. Not all homework will be collected. Nonetheless, it isimportant for you to do all the homework to keep up with the material weare learning and to prepare for exams.. |
| **13. Forms of teaching**Using one of the following or may be using all of the following:1. The lecture method.
2. Discussion method.
3. The method of exploration.
4. Practice in Lab

White board, notes of teacher |
| **14. Assessment scheme**First Examination 20Second Examination 20Home works and Quizzes 10Final Examination 50**Total 100**‌‌‌ |
| **15. Student learning outcome:** After successfully completing the course the student will be able to apply concepts of Maple to solve a variety of practical problems also you will have a good understanding of the following topics and their applications:* Introduction for Programming in maple
* Solving Computational Problems
* how to do repetitive computations using loops and conditional statement
* Variables, Functions, Sequences, Lists, Sums and Products Integral Calculus.
* **Matrices and Vectors**

Attendance is required and will be taken at the beginning of each class. If you must miss a class, it is your responsibility to contact me to get your assignments. |
| **16. Course Reading List and References‌:**▪ **Key references**: 1. Martha L. Abell and James P. Braselton, Maple byExample, 20052. K A Guide to Maple, 1st Edition. Copy right 1999. (Secondary Reference)**3. ,,2001.** |
| **17. The Topics:** |  |
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| Introduction to programming in Maple |
| Procedure with examplesConvert by programSolution of equationsLoops - Examples |
| Conditional statementProgramming in mathematics |
| Approximation of seriesProgram of average , sequences |
| Program plot graph of Functions:Decision Structures - Examples |
| Other Expressions in Maple - Examples |
| Nesting |
| Recursive Functions – Examples |
| Exam 1 |
| Programming in maximum and minimum: If - Examples |
| Sort: If - Examples |
| Programming in Maple: For Loop - Examples |
| Programming in Maple: For mathematics - Examples |
| Some Example on Programming :prime numbers |
| Exam (2) |
| Vectors – Examples |
| Matrices - Examples |
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| **18. Practical Topics (If there is any)** |  |
| Final Exams2017-2018 |  |
| **19. Examinations:**Q1.Write a program in maple to calculate 1-$\frac{1}{3}+\frac{1}{5}-\frac{1}{7}+\frac{1}{9}-…$ (5 marks)Q2.1)Write a program to plot a function $y=f(x)$ together with its derivative $f^{'}(x)$ on the interval $\left[a,b\right].$ Plot function $y=f\left(x\right)=x^{3}+2 x-1$ together with its derivative $f^{'}(x)$ on $\left[1,5\right].$2)Write a program to plot a function $y=f(x)$ together with its integral $f(x)$ on the interval $\left[a,b\right].$ Plot function $y=f\left(x\right)=x^{3}+2 x-1$ together with its integral $f(x)$ on $\left[1,5\right].$ (10 marks)Q2. Write a program in maple to find summation of even and odd numbers from 1 to n where n>1.Q3. Write a program in maple to convert complex $z=x+iy$ to polar form $z=re^{i θ}$ Q4. Write output of the following in maple.(9 marks)1) 2)   3)  Q5.The following table shows some Maple commands, together with the output that the user expected to get. In each case, the command has one or more errors, so the output not to be as expected. Give a corrected version of each command.(10 marks)

|  |  |  |
| --- | --- | --- |
| No | Input | Expected output |
| 1 | F:=Proc(x)x \*1250F(5) | 6250 |
| 2 |  | $$1$$ |
| 3 |  | $$16 $$49100 |
| 4 | for i from 1 to 30 doprint(i)od |  |
|  |  |  |

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| **20. Extra notes:** Note About office Hours: I encourage you to come by my office if you have any questions, need help with homework problems, or would just like to talk about the material. I will be in my office during my office hours, but if you plan to come by it may help to send an email before to let me know to expect you. If you want to meet with me but cannot make it to office hours, email me and we can set up a mutually convenient time to meet. |
| **21. Peer review** ت.‌‌  |