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**Department of Mathematics**

**College of Basic education**

**University of Salahaddin -Hawler**

**Subject: Maple**

**Course Book –Year 3**

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

**Academic Year: first course 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** | Expressions and Functions, Graphing Functions, Expressions, and Equations, Solving Equations and Inequalities, Three-Dimensional and Contour Plots; GraphingEquations, Programming in Maple. |
| **10. Course overview:**The purpose of this course is to give students knowledge in order to how they use Maple and its commands in mathematics, and teach them to make graphs and programming. |
| **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. Because of its versatility, Maple has established itself as the computer algebra system of choice for many computer users including commercial and government scientists and engineers, mathematics, science, and engineering teachers and researchers, and students enrolled in mathematics, science, and engineering courses. |
| **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.White board, notes of teacher |
| **14. Assessment scheme**First Examination 20Second Examination 20Home works and Quizzes Final Examination 60**Total 100**‌‌‌ |
| **15. Student learning outcome:** After successfully completing the course the student will be able to apply concepts of Mapleto solve a variety of practical problems also you will have a good understanding of the following topics and their applications:* Graphing Functions in 2D ad 3 D
* Solving Equations and Inequalities
* Programming in maple
* Differential Calculus
* 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 and Getting Started with Maple |
| Basic Operations on Numbers, Expressions, and FunctionsNumerical Calculations and Built-In Constants - Examples |
| Basic Operations on Numbers, Expressions, and FunctionsBuilt-In Functions – Examples |
| Expressions and Functions:Basic Algebraic Operations on Expressions - Examples |
| Expressions and Functions:Naming and Evaluating Expressions - Examples |
| Other Expressions in Maple - Examples |
| Other Expressions in Maple - Examples |
| Calculus: Limits – Examples |
| Calculus: Differentiation – Examples |
| Calculus: Differentiation – Examples |
| Exam (1) |
| Calculus: Integration – Examples |
| Calculus: Integration – Examples |
| Calculus: Series – Examples |
| Plotting single expressions – Examples |
| Some properties of plotting (Font, Title, Color, Legend, …) - Examples |
| Plotting multiple expressions - Examples |
| 3D-Plotting – Examples |
| Some examples on plotting |
| Programming in Maple: If - Examples |
| Programming in Maple: If - Examples |
| Programming in Maple: For Loop - Examples |
| Programming in Maple: For Loop - Examples |
| Some Example on Programming |
| Exam (2) |
| Vectors – Examples |
| Matrices and some operations on it - Examples |
| Matrices and some operations on it - Examples |
| Matrices and some operations on it - Examples |
| Matrices and some operations on it - Examples |

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| **18. Practical Topics (If there is any)** |  |
| Final Exams2017-2018 |  |
| **19. Examinations:**Q1.A.Give the commands in Maple for solve the initial value problem$\frac{d^{3}y}{dx^{3}}+3\frac{dy}{dx}+5 y=sin^{-1}\left(x\right) ,y\left(0\right)=0 \frac{dy}{dx}\left(0\right)=1,\frac{d^{2}y}{dx^{2}}\left(0\right)=2$. (2 marks)B.Write a program in maple to calculate 1-$\frac{1}{3}+\frac{1}{5}-\frac{1}{7}+\frac{1}{9}-…$ (3 marks)Q2.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 | Series($ \frac{x}{1-x},x=0,4)$ |  |
| 2 | diff($y^{2}=x^{2}+4x-1,y,x)$ | $$\frac{x+2}{y}$$ |
| 3 | solve(sin(2x)=1,x); | $$\frac{π}{4}+nπ , n\in Z $$ |
| 4 | for i from 1 to 30 doprint(i)od |  |
| 5 | **>** **>**  |  |

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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.‌‌  |