

Past projects in Math 3820

February 4, 2007

Abstract

This is a list of some projects that were written in Math 3820 (and previous course denominations), under the supervision of Dr. T.G. Berry. This list is sorted, as much as possible, by topical area (ordered from more popular to less popular), then by author last name. Topics where only one person wrote a project are listed in the last section. Also included (last page) is the marking scheme used by Dr. Berry for evaluating the projects.

1 Pharmacokinetics

Pharmacokinetics is the study of the action of drugs in the body.

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| 1. | Projet name : Administration of drugs
Student name : Stella Chan
Project date : April 1997 |
| 2. | Projet name : A model for drug dosage
Student name : Paul Dyck
Project date : April 2000 |
| 3. | Projet name : Prescribing drug dosage
Student name : Tebe Haile
Project date : April 1994 |
| 4. | Projet name : Mathematical modeling of pharmacokinetics
Student name : Alex Hordosi
Project date : |
| 5. | Projet name : Pharmacokinetics
Student name : Loritta McKnight
Project date : |

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| 6. | Project name : Quantitative pharmacokinetics
Student name : Shane Petroff
Project date : |
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| 7. | Project name : Pharmacokinetics – The modeling of drug administration
Student name : Ian Proven
Project date : March 1990 |
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| 8. | Project name : An introduction to the basic ideas of the mathematics behind pharmacokinetics
Student name : Tyeba Siddiqui
Project date : April 1999 |
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| 9. | Project name : Model in Pharmacokinetics (repeated use of dosage)
Student name : Tina Tam
Project date : |
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| 10. | Project name : A study of a two-compartment model for the oral administration of drugs
Student name : Michael Walker
Project date : April 1991 |
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| 11. | Project name : Administration of drugs
Student name : Violetta Zbaraszewski
Project date : April 1999 |
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2 Epidemics and rumors

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| 12. | Project name : Epidemic modelling
Student name : S. Appadoo
Project date : |
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| 13. | Project name : The spread of AIDS in Canada 1987-1995
Student name : Tamira Loewen
Project date : April 1999 |
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| 14. | Project name : A logistic model for the spread of epidemics
Student name : Vajira Pathirana
Project date : April 1999 |
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| 15. | Project name : Rumor diffusion
Student name : Jodi Preston
Project date : |
| 16. | Project name : The study of spread of rumors in society
Student name : Danielle Southern
Project date : April 1997 |
| 17. | Project name : Modelling epidemics
Student name : Kelly Spiers
Project date : |
| 18. | Project name : Model of an epidemic
Student name : Sean Spryszak
Project date : April 1993 |
| 19. | Project name : Epidemics
Student name : Larysa Zubach
Project date : April 1997 |

3 Predator-prey models

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| 20. | Project name : A logistic predator-prey model
Student name : Sarah H. Dean
Project date : April 1994 |
| 21. | Project name : Two species population dynamics
Student name : Stacey De Sutter
Project date : April 1999 |
| 22. | Project name : Interacting populations: predator prey model
Student name : Greg Didyck
Project date : April 1992 |
| 23. | Project name : Stability analysis of a modified predator prey model
Student name : Janet R. Grad
Project date : April 1990 |

24.	Project name	: Stability of a nonlinear diffusive predator-prey system
	Student name	: Qing Yin
	Project date	:

4 Heating and cooling

25.	Project name	: Newton's law of cooling: a mathematical model of heat exchange in a building
	Student name	: Loretta Bourgouin
	Project date	: April 1997

26.	Project name	: A brief analysis of Newton's law of cooling
	Student name	: Kristen Kruse
	Project date	: April 1997

27.	Project name	: The cooling of a cup of coffee
	Student name	: Janice Morgan
	Project date	: April 1993

28.	Project name	: Determination of time of death
	Student name	: Ormanda Niebergall
	Project date	: April 1999

5 Cell and tumor growth

29.	Project name	: The Gompertz model for tumor growth
	Student name	: Charlene Budzinsky
	Project date	: April 1990

30.	Project name	: The mathematical modeling of tumor growth and the process of irradiation
	Student name	: Teresa Longobardi
	Project date	: April 1992

31.	Project name	: Models for the dynamics of cell growth
	Student name	: Liang Tang
	Project date	: April 1993

6 Radioactive decay

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| 32. | Project name | : The radioactive decay of ^{210}Pb |
| | Student name | : Brian Kapalka |
| | Project date | : April 1992 |
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| 33. | Project name | : Modeling of radioactive decay |
| | Student name | : Changyi Lu |
| | Project date | : |
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| 34. | Project name | : Radio-active decay (linear cascades) |
| | Student name | : Steve Matthews |
| | Project date | : |

7 Traffic flow problems

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| 35. | Project name | : Green lights & traffic humps |
| | Student name | : Matthew Greenberg |
| | Project date | : April 2000 |
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| 36. | Project name | : The Humber Tunnel Authority: A recommended vehicle speed and separation distance to alleviate congested tunnel traffic flow |
| | Student name | : Michael P. Lukie |
| | Project date | : April 1999 |

8 Various topics

The following are subjects that have been treated by no more than one student.

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| 37. | Project name | : Analysis and applications of the Dissolved Oxygen Deficit resulting from wastewater treatment discharge |
| | Student name | : Jamie Brewster |
| | Project date | : April 2000 |
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| 38. | Project name | : Modeling the relativistic rocket |
| | Student name | : Brian Corbett |
| | Project date | : |

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| 39. | Project name : Plant growth
Student name : Monique Dion
Project date : April 1995 |
| 40. | Project name : Population and technology: a professor-student model for the growth and progress of knowledge
Student name : Ken Hill
Project date : April 1997 |
| 41. | Project name : Harvesting a single-species population
Student name : John Kmetec
Project date : April 1989 |
| 42. | Project name : Call volume for a major call centre
Student name : Delene Matula
Project date : |
| 43. | Project name : An introduction to interest rate generators
Student name : Michael McDermid
Project date : April 1999 |
| 44. | Project name : Learning models
Student name : Wesley Miyai
Project date : April 1989 |

Study of a stochastic model of learning in dogs, to compare with Pavlov's experiments.

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| 45. | Project name : A mathematical model for speed-wobble in motorcycles
Student name : Stephanie Olafson
Project date : April 1997 |
| 46. | Project name : Mathematical modelling for fish population
Student name : Prem Patni
Project date : April 1995 |
| 47. | Project name : Modelling the motion of a paraglider
Student name : Shawn Podborsky
Project date : |

48.

Project name	:	Two force arms-race: a modified Lanchester combat model
Student name	:	Trevor Oltsher
Project date	:	April 1996

GRADING SHEET – MODELLING PROJECTS

STUDENT NAME:
PROJECT TITLE:

Grammar, Spelling	5		
Description of problem	5		
Identification of variables and parameters	5		
Assumptions, including reasons and description	10		
Mathematical analysis	20		
Conclusions and suggestions for improvement	5		
Example(s)	5		
References	5		
Additional comments	Total (out of 60)		