

DEPARTMENT OF MATHEMATICS



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Head of Department

WORK OF DEPARTMENT

As at August 2014, the teaching staff of the Department of Mathematics was composed of 2 Professors, five senior lecturers, five lecturers, four assistant lecturers, four adjunct lecturers/tutors. Of these, seven members of staff hold a PhD (one, in addition to PhD, has a Higher Doctorate degree) and one person is a Fellow of the Canadian Institute of Actuaries (UK). In December Professor Girija Jayaraman, returned home to India after a two years visit to the Department. Dr. Shoyeb Waliullah, joined the staff of the department as a lecturer in October 2014, departing at the end of Semester 2 of the academic year. Mr Howard Hines, who is a Fellow of the Society of Actuaries (FSA), joined the staff of the department in January 2015.

The Department continues to collaborate with various departments in the Faculty, offering mathematics courses to suit their needs: MATH1185

for Chemistry & Physics students, COMP1110 for Computing students, and MATH1180 and MATH2330, for engineering students.

The University of the West Indies introduced a new GPA system in September 2014, and the department adjusted its approach to grading accordingly.

Professor Gabriel Lord, Heriot-Watt University, Edinburgh, UK, visited the department over the period March 17-20, and gave a mini-course to graduate students on introductory stochastic partial differential equations and numerical methods on Wednesday March 18, 5–7pm. He also gave a departmental seminar entitled “Stochastic Traveling Waves and Computation” on Friday March 19, 11am. He additionally met informally with graduate students to discuss their projects and began collaboration with staff members in the area of stochastic numerical analysis.

The Department has a formal internship programme which was piloted in 2011/12 and runs during the summer break each year. This year's programme was officially launched in May 2015 and 36 students applied, with 19 positions being offered by the following organisations: Financial Services Commission, Scotiabank, Jamaica National Group, Jamaica Coop Credit Union League, Guardian Life Ltd, Duggan Consulting.

The Department of Mathematics established an Industry Advisory Board to provide high level formal Industry/Mathematics interaction to produce suitable graduates for the work place. The Committee is composed of members from Industry and Mathematics Department, and the first meeting took place in April 2015.

Department held its second Career Fair in November 2014: 6 out the 9 companies who had confirmed participation were present, and the other 3 were unable to attend due to unexpected heavy rain. Companies participating were Jamaica National Building Society, Sagicor Life Jamaica Limited, Guardian Life, Victoria Mutual Building Society, National Commercial Bank and the Jamaica Stock Exchange. 59 semi-formally dressed students who registered prior to the event participated. The feedback received from the companies was positive.

Department of Mathematics

Throughout the academic year, the department continued its preparation to submit an application for the Mona campus to be recognised as a Center of Actuarial Excellence by the Society of Actuaries.

For the academic year 2014/15 a total of 1,174 students registered for all level courses in the department broken down as follows: Preliminary level – 206; Level 1 – 678; level 2 – 189; level 3 – 102.

The Department participated in various outreach activities across the island including “Science in the Park” and at the Western campus. We also conducted CAPE workshops over in January 2015 at the Western Campus, in Montego Bay, and in the department at the Mona campus in April 2015. A one-day CSEC Workshop was delivered by Mr. Ajani Ausaru at Mona High School. The events were well represented. In March 2015, the department was represented by Ms. Kimberly Boswell in round table discussions, at the Heart Trust NTA's National Career Symposium.

CONFERENCE PARTICIPATION WITH PAPER/TALK PRESENTED

- **Dr. Conall Kelly** organized the AIM SQuaRE workshop: “Stochastic stabilization of limit cycle dynamics in ecology and neuroscience”. American Institute of Mathematics, San Jose, California, USA. April 13–17, 2015.
- **Dr. Conall Kelly** presented the paper “Polynomial difference equations under stochastic perturbation”, Kyoto Conference on Numerical Analysis and Differential Equations, September 2014, Kyoto University Rakuyu-Kaikan, Japan.
- **Professor Alexandra Rodkina** participated in the workshop “Stochastic Stabilization of limit-cycle dynamics arising in ecology and neuroscience” San Jose, California, USA, April 13–17, 2015.
- **Professor Alexandra Rodkina** presented the paper “Discretized Ito formula and applications” at the International Congress of Mathematicians 2014, August 13–21, Seoul, South Korea.
- **Dr. Dmitry Malinin** presented the paper “On integral irreducible

representations of finite groups” at the International Algebraic Conference dedicated to the 100th anniversary of L.A. Kaluzhnin, Kiev, July 7–12, 2014.

- **Dr. Dmitry Malinin** presented the paper “On integral representations of finite groups” at the XII Conference in “Algebra, Number Theory and Discrete Geometry, Contemporary problems and applications, Russ Acad Sciences, Tula. Russia.
- **Dr. Dmitry Malinin** presented the paper “On integral representations of finite groups and some applications”, International Congress of Mathematicians 2014, August 13–21, ICM 2014, Seoul.
- **Dr. Dmitry Malinin** presented the paper “On finite group schemes and Galois modules”, Journees Arithmetiques, Debrecen, Hungary, July 6–11, 2015
- **Binil Thomas-Sebastian** presented the paper, jointly with Nagarani Ponakala, “Dispersion in Unsteady Casson Fluid in an Annulus with Wall Absorption” The 10th Faculty of Science and Technology Conference, UWI, Mona, June 9–11, 2015.
- **Andre Alexander Small** presented the paper, jointly with Nagarani Ponakala and Girija Jayaraman, “Peristaltic Transport of A Newtonian Fluid in a finite length tube”, the 10th Faculty of Science and Technology Conference, UWI, Mona, June 9–11, 2015.
- **Kirk Morgan** presented the poster “Non-existence of bound states for the Dirac-equation in the Kerr-de-Sitter metric”, The 14th Marcel Grossman Meeting, University of Sapienza – Rome, Italy July 12–18, 2015.

CONFERENCE AND SEMINARS PARTICIPATION WITHOUT PAPER/TALK

- **Mr. Richard Plummer** attended a seminar on “Applied Finance with R”, University of Illinois at Chicago, May, 2015.
- **Mr. Richard Plummer** attended the 22nd International Conference of Adults Learning Maths (ALM); Theme “Opening Our Mathematical Eyes”: Alexandria, VA Washington DC, July, 2015.

- **Kirk Morgan**, attended the conference entitled “Topology and its Applications” at the City of University of New York – College of Staten Island, Staten Island, New York, USA., July 23–26, 2015.

INVITED VISITS AND SEMINARS

- **Dr. Conall Kelly** presented the seminar “Lyapunov exponents and stochastic systems”, Department of Mathematics, The UWI at Mona, October 2014.
- **Dr. Conall Kelly** presented the seminar “Polynomial difference equations under stochastic perturbation”, Stochastic dynamics research group seminar, The UWI at Mona, December 2014.
- **Dr. Conall Kelly** presented the seminar “Stochastic stability analysis of a reduced galactic dynamo model with perturbed ϵ -effect” to the workshop “Stochastic stabilization of limit cycle dynamics in ecology and neuroscience”. American Institute of Mathematics, San Jose, California, USA. April 2015.
- **Professor Alexandra Rodkina** visited University of Calgary, Calgary, Canada, May-June 2015 with Professor E. Braverman to pursue research activities.
- **Professor Alexandra Rodkina** visited University of Texas A & M College Station, Texas, USA, April 2015 Professor P. Kouchment to pursue research activities.
- **Dr. D. Batic** presented the seminar “The Dirac equation in the Kerr-de Sitter metric: analysis of the eigenvalues of the angular problem”, Universidad de los Andes, Bogota, Colombia, January 2015.
- **Dr. D. Batic** presented the seminar “Potentials of the Heun class”, Petroleum Institute, Abu Dhabi, Arab Emirates, March 2015.

PUBLICATIONS

- B.T. Sebastian and **P. Nagarani**, “Effect of Boundary Absorption on Dispersion of a Solute in Pulsatile Casson Fluid Flow”, *Interdisciplinary Topics in Applied Mathematics, Modeling and Computational Science*, Ed. By Cojocaru, M. Kotsireas, I.S., Makarov, R. Melnik, R.V.N. Shodiev, H. Springer, 2015, 117, 389-395.
- N. Dokuchaev, **A. Rodkina**, “On asymptotic optimality of Merton’s myopic portfolio strategies under time discretization”. *IMA Journal of Mathematical Control and Information* (2015), pp. 18, doi: 10.1093/imamci/dnv020.
- **A. Rodkina**, “On almost sure asymptotic stability properties of the delay stochastic difference equations with multiple noises”, Chapter the book by F. Hartung and M. Pituk (eds.), *Recent Advances in Delay Differential and Difference Equations*, Springer Proceedings in Mathematics & Statistics 94, DOI 10.1007/978-3-319-08251-610, Springer International Publishing Switzerland 2014, 219-232.
- **Dr. Dmitry Malinin**, Nor Muhainiah Mohd Ali, Nor Haniza Sarmin, “Representations of some groups and Galois stability”, *Bulletin of the Malaysian Mathematical Sciences Society*, vol. 39, Issue 2 (2015), Page 827-840, Springer, DOI: 10.1007/s40840-014-0051-7, published online: Nov. 10, 2014.
- J. Jaraden, **Dmitry Malinin**, N.K. AlOushoush, “On S-quasinormal subgroups of finite groups and some applications”, accepted for publication in *Mathematical Sciences Letters*, vol. 4, No. 2, 2015.
- **D. Batic**, D. Mills-Howell and M. Nowakowski, Potentials of the Heun class: the triconfluent case, *Journal of Mathematical Physics* 56, 052106 (17pp) (2015).
- **D. Batic**, S. Nelson and M. Nowakowski, Light on curved backgrounds, *Physical Review D* 91, 104015 (35pp) (2015).
- R. Williams and **D. Batic**, The two-point connection problem for a subclass of the Heun equation, *Journal of Inequalities and Special Functions* 6, 1 (11pp) (2015).

- C. Posada and D. Batic, Electrovac universes with a cosmological constant, *Central European Journal of Physics* 12, 297 (8pp) (2014)

INCOME GENERATION

The department offered 14 full courses across all levels and 14 examination-only sittings for Level 3 courses as part of its annual summer school. We anticipate that income will be received from the MSc Enterprise Risk Management programme (offered jointly with Mona School of Business & Management) at the end of the financial year.

PUBLIC SERVICE

- Dr. N. Ponakala served as External Examiner for the Department of Mathematics, University of Technology, Jamaica.
- Dr. N. Ponakala served as University Examiner for Department of Mathematics and Statistics, the University of the West Indies, St. Augustine Campus, Trinidad & Tobago.

Members of the department also regularly act as editors and peer reviewers for international journals.

STUDENTS

The department has graduated an average of 72.2 B.Sc. students per year since 2010 with one of the following degrees: BSc Mathematics (major or minor), BSc Actuarial Science, BSc Mathematics with Education, BSc Mathematics with Economics, and BSc Mathematics & Modelling Processes.

Since 2010 to 2014, a total of 361 students graduated from the department. This is broken down as follows:

2010	2011	2012	2013	2014
52	68	62	105	74

This year a total of thirteen students graduated with a First Class Honours degree.

Information on Students

The number of students graduating in each programme over the last five years is shown below:

Year	Math	Actuarial Sci.	Math/ Ed	Math/ Econ	Math/ Modelling	Total
2010/11	7	35	1	9	–	52
2011/12	18	33	2	15	–	68
2012/13	18	26	6	10	2	62
2013/14	19	38	18	26	4	105
2014/15	8	57	2	3	4	74

For the 2014/15 academic year the total number of registered undergraduate students is as follows:

Preliminary level	206
Level I	678
Level II	189
Level III	102

Undergraduate Research

Two Actuarial Science students presented their work at the FIU McNair Scholars Research Conference held at Florida International University, Miami, USA over October 16–18. Four final-year students presented the results of their research project at the 10th Conference of the Faculty of Science and Technology, as part of the undergraduate forum, at which another group presented a poster.

Mathematics Bridging Programme

The programme ran for Nine (9) weeks with 1 tutor and fourteen (14) registered students. Despite the low attendance, the department continues to encourage persons to attend and has made a plan to embark on intensive advertisement to increase its numbers for the upcoming academic year.

Mathematical Olympiad

The Department of Mathematics organized two Olympiad programmes last year. The Junior Mathematical Olympiad was held in three rounds for students in Grades 4, 5, and 6. The Jamaican Mathematical Olympiad was held in four rounds for students in Grades 7 through 11. The department also took a team of three students to an international mathematics competition, held in Mexico in June 2015, at which they won their second medal.

GRADUATE PROGRAMMES

MSc Enterprise Risk Management

This year we received our third cohort of 20 students in Semester 1 of 2014/2015. The first set of students graduated from this programme in November 2014 with 12 students receiving their degrees with Distinction. This year students from cohort 2 are expected to complete their requirement for their award of their degree.

MSc Mathematics Programme:

The department awarded for the first time, a bursary to one student in the MSc Mathematics. The award was based upon examination performance and financial need, covers the cost of fees and provides a contribution to living expenses. In addition, two further students were awarded grants for the purchase of academic materials, one of which was generously provided by Professor Jayaraman.

Research Students

During the 2014/15 academic year there were 5 MPhil students and 2 PhD students registered in the department.

One PhD (Dr. Peter Palmer) and two MPhil students (Mr. Runako Williams & Mr. Dujon Dunn) graduated this year with one of the student – Mr. Williams received the award for Most Outstanding Thesis from Graduate Studies & Research, Mona Campus.

Both Mrs. Binil Sabastian-Thomas and Mr. Andre Small submitted their theses for examination at the end of the academic year.