

# Alexey Glazyrin

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## Education

M.S. Mathematics (cum laude), Moscow State University, Faculty of Mechanics and Mathematics, Department of Number Theory (2006).  
Ph.D. Mathematics, Moscow State University (2009), scientific advisor – professor N. Dolbilin.

## Positions held

The University of Texas at Brownsville – Assistant Professor (2010-2015)  
The University of Texas Rio Grande Valley – Assistant Professor (2015-2016)  
The University of Texas Rio Grande Valley – Associate Professor (2016-2022)  
The University of Texas Rio Grande Valley – Professor (2022-)

## Long-term visits

ICERM, Brown University, February-May 2018

## Teaching and Research Fields

Combinatorics, Discrete Geometry, Computational Geometry, Geometry of Numbers

## Grants and awards

### *Successful external applications*

Russian Foundation for Basic Research (RFBR) grant 08-01-00565 – personnel (2008-2010)

NSA Mathematical Sciences Program Conference Grant H98230-11-1-0234 (\$15,000) – personnel (2011-2012)

NSF Division of Mathematical Sciences 1101688 "Collaborative Research: Positive definite functions in distance geometry and combinatorics" (\$120,000) – co-PI (2011-2014)

NSA Mathematical Sciences Program Conference Grant H98230-12-1-0289 (\$15,000) – personnel (2012-2013)

NSF Division of Mathematical Sciences 1400876 "Sphere packings and related extremal problems" (\$160,000) – co-PI (2014-2017)

NSF Division of Mathematical Sciences 1623600 "Conferences on Discrete Geometry and Algebraic Combinatorics" (\$40,000) – co-PI (2016-2018)

NSF Division of Mathematical Sciences 1904635 "Conferences on Discrete Geometry and Algebraic Combinatorics" (\$15,000) – co-PI (2019-2021)

NSF Division of Mathematical Sciences 2054536 "RUI: Point Configurations in Euclidean Spaces, Spheres, and Discrete Spaces" (\$179,999) – PI (2021-2024)

### *Participation in grants*

PPOHA grant – developer of several undergraduate and graduate online courses (2010-2012) (Calculus II undergraduate course, Discrete Mathematics graduate course, Graph Theory graduate course)

MSEIP grant – developer of the Calculus readiness assessment tool (2012)

Russian Government Megagrant project 11.G34.31.0053 (2011-2013) – external member of the Delaunay Lab of Discrete and Computational Geometry, Yaroslavl State University

### *Internal grants, travel grants, and collaboration grants*

Dean's Faculty Development Fund – travel to Toronto, Canada (2011)

Dean's Faculty Development Fund – travel to San Diego (2012)

Start-up grant – "Conference on Discrete Geometry and Algebraic Combinatorics" (2013-2014)

Dean's Faculty Development Fund – travel to Los Angeles (2014)

Dean's Faculty Development Fund – travel to Kyoto, Japan (2015) (travel was canceled)

US Junior Oberwolfach Fellow – participation in "Arbeitsgemeinschaft: Mathematical Quasicrystals" (2015)

Faculty Development Funding Program – participation in the summer school "Transversal Aspects of Tilings" (2016)

Junior Faculty Travel Support Program – participation in the AMS Spring Southeastern Sectional Meeting (2016)

Faculty Travel Support Program – participation in the Joint Mathematics Meetings (2017)

College of Sciences Seed Grant "Research Cluster Computational Geometry and Biology" (\$20,000) – co-PI (August 2017 - December 2018)

US Junior Oberwolfach Fellow – participation in "Statistics for Data with Geometric Structure" (2018)

American Mathematical Society Travel Grant for the 2018 International Congress of Mathematicians

College of Sciences Seed Grant "Modeling and Behavior of Systems with Spherical Particles" (\$11,118) – PI (April 2018 - October 2019)

Faculty Travel Support Program – participation in Optimal Point Configurations and Potential Theory, CIEM Castro Urdiales, Cantabria, Spain (2019)

Collaborate@ICERM "Codes and Designs: Optimal Discrete Measures", ICERM, Brown University (with D. Bilyk, D. Ferizović, R. Matzke, J. Park, O. Vlasjuk), August 2021

### *Honors & Awards*

All-Russian Mathematical Olympiad – Golden Medal (1999, 2001), Silver Medal (2000)

International Mathematical Olympiad – Golden Medal (2001)

Vladimir Potanin Foundation Scholarship (2001-2006)

Russian Federation President Scholarship (2001)

UTB College of Science, Mathematics and Technology Recognition for Excellence in Research (2014)

UTRGV College of Sciences Faculty Excellence Award in Research/Scholarship/Creative Activity (2023)

### **Publications**

See also my [Google Scholar profile](#).

### *Preprints*

“Stability of optimal spherical codes”, [arXiv:1711.06012](#) (with Károly J. Böröczky)

“Moments of isotropic measures and optimal projective codes”, [arXiv:1904.11159](#)

“On the size of maximal binary codes with 2, 3, and 4 distances”, [arXiv:2210.07496](#) (with A. Barg, W.-J. Kao, C.-Y. Lai, P.-C. Tseng, W.-H. Yu)

“Extensions of polynomial plank covering theorems”, [arXiv:2211.10886](#) (with R. Karasev and A. Polyanskii)

“Optimizers of three-point energies and nearly orthogonal sets”, [arXiv:2303.12283](#) (with D. Bilyk, D. Ferizović, R. Matzke, J. Park, O. Vlasiuk)

“Optimal measures for multivariate geometric potentials”, [arXiv:2303.14258](#) (with D. Bilyk, D. Ferizović, R. Matzke, J. Park, O. Vlasiuk)

“Note on illuminating constant width bodies”, [arXiv:2305.04485](#)

“On the total perimeter of disjoint convex bodies”, [arXiv:2308.16340](#) (with A. Akopyan)

### *Peer-reviewed journals and book chapters*

“The lonely vertex problem”, *Beiträge zur Algebra und Geometrie (Contributions to Algebra and Geometry)*, Vol. 50 (2009), No. 1, pp. 71-79, [arXiv:0710.4870](#) (with D. Frettlöh)

“Anti-Dürer conjecture for non-convex polytopes”, *Russian Mathematical Surveys*, 64:3 (2009), pp. 573-574, [doi:10.1070/RM2009v064n03ABEH004623](#) (with A. Tarasov)

“On simplicial partitions of polytopes”, *Mathematical Notes*, 85:6 (2009), pp. 799-806, [doi:10.1134/S0001434609050228](#)

“The extremal spheres theorem”, *Discrete Mathematics*, Volume 311, Issues 2-3 (2011), pp. 171-177, [arXiv:0906.3823](#) (with A. Akopyan, O. Musin, A. Tarasov)

“Lower bounds for the simplicity of the n-cube”, *Discrete Mathematics*, Volume 312, Issue 24 (2012), pp. 3656-3662, [arXiv:0910.4200](#)

“Upper bounds for the perimeter of plane convex bodies”, *Acta Mathematica Hungarica*, Volume 142, Issue 2 (2014), pp. 366-383, doi:10.1007/s10474-013-0350-8 (with F. Moric)

“Functionals on triangulations of Delaunay sets”, *Moscow Mathematical Journal*, Volume 14, Number 3 (2014), pp. 491-504, arXiv:1211.7053 (with N. Dolbilin, H. Edelsbrunner, O. Musin)

“On maximum volume simplices in polytopes”, *Periodica Mathematica Hungarica*, Volume 69, Issue 2 (2014), pp. 251-256, doi:10.1007/s10998-014-0051-2 (with A. Akopyan)

“Finite two-distance tight frames”, *Linear Algebra and its Applications*, Volume 475 (2015), pp. 163-175, arXiv:1402.3521 (with A. Barg, W.-H. Yu, K. Okoudjou)

“The Voronoi functional is maximized by the Delaunay triangulation in the plane”, *Combinatorica*, Volume 37, Issue 5 (2017), pp. 887-910, arXiv:1411.6337 (with H. Edelsbrunner, O. Musin, A. Nikitenko)

“Stability of the simplex bound for packings by equal spherical caps determined by simplicial regular polytopes”. In Conder M., Deza A., Weiss A. (eds) *Discrete Geometry and Symmetry*, GSC 2015, Springer Proceedings in Mathematics & Statistics, vol 234, Springer, Cham (2018), pp. 31-06, arXiv:1711.00211 (with Károly Böröczky, Károly J. Böröczky, Ágnes Kovács)

“Upper bounds on s-distance sets and equiangular lines”, *Advances in Mathematics*, Volume 330 (2018), pp. 810-833, arXiv:1611.09479 (with Wei-Hsuan Yu)

“Covering a ball by smaller balls”, *Discrete & Computational Geometry*, Volume 62 (4) (2019), pp. 781-787, doi:10.1007/s00454-018-0010-4

“Contact graphs of ball packings”, *Journal of Combinatorial Theory, Series B* 145 (2020), pp. 323-340, arXiv:1707.02526

“Repeated minimizers of  $p$ -frame energies”, *SIAM Journal on Discrete Mathematics*, 34(4) (2020), pp. 2411-2423, arXiv:1901.06096 (with J. Park)

“Energy on spheres and discreteness of minimizing measures”, *Journal of Functional Analysis*, 280 (11) (2021), 108995, arXiv:1908.10354 (with D. Bilyk, R. Matzke, J. Park, O. Vlasiuk)

“Hexagon tilings of the plane that are not edge-to-edge”, *Acta Mathematica Hungarica*, 164 (2021), pp. 341-349 arXiv:1911.12752 (with D. Frettlöh and Z. Lángi)

“Covering by homothets and illuminating convex bodies”, *Proceedings of the American Mathematical Society*, 150 (02), pp. 779-793 (2022), arXiv:1905.10516

“Domes over curves”, *International Mathematics Research Notices*, 18 (2022), pp. 14067-14104, arXiv:2005.02555 (with I. Pak)

“A short solution of the kissing number problem in dimension three”, *Discrete & Computational Geometry*, 69 (3) (2023), pp. 931-935 arXiv:2012.15058

“Optimal measures for  $p$ -frame energies on spheres”, *Revista Matemática Iberoamericana*, 38 (4) (2022), pp. 1129-1160, arXiv:1908.00885 (with D. Bilyk, R. Matzke, J. Park, O. Vlasiuk)

“Potential theory with multivariate kernels”, *Mathematische Zeitschrift*, 301 (3) (2022), pp. 2907-2935, arXiv:2104.03410 (with D. Bilyk, D. Ferizović, R. Matzke, J. Park, O. Vlasiuk)

“Covering by planks and avoiding zeros of polynomials”, *International Mathematics Research Notices*, 13 (2023), pp. 11684-11700 arXiv:2112.05382 (with R. Karasev and A. Polyanskii)

*Proceedings, extended abstracts, appendices*

"On a new property of polyhedral tilings", *Proc. Ninth International Seminar "Discrete Mathematics and its Applications"*, 377-379, 2007 (in Russian)

"Triangulations of 2-layers polytopes", *Proceedings of Second COE Workshop on Sphere Packings*, 90-94, May 30 - June 3, 2005

"Rigidity of some classes of cubillages", *Proceedings of Second COE Workshop on Sphere Packings*, 86-89, May 30 - June 3, 2005 (with A. Garber)

"Optimality of functionals on Delaunay triangulations", *Proceedings of the workshop on distance geometry and applications*, Manaus, Brazil, 115-118, June 24-27, 2013 (with N.Dolbilin, H.Edelsbrunner, O.Musin)

"Functionals on Triangulations of Delaunay Sets", *Yaroslavl International Conference "Geometry, Topology, and Applications"*, September 23-27, 2013. Abstracts, Yaroslavl, 2013, 33-37 (with N.Dolbilin, H.Edelsbrunner, O.Musin)

"Price of SDP relaxations for spherical codes (Designs, Codes, Graphs and Related Areas)", *RIMS Kokyuroku Bessatsu*, Volume 1889, 2014, 1-6 (with O.Musin)

Appendix in "Maximizing powers of the angle between pairs of points in projective space", *Probability Theory and Related Fields*, 184, 1197-1214 (2022) by T. Lim and R. McCann, 2022 (Appendix with D. Bilyk, R. Matzke, J. Park, and O. Vlasiuk)

## Talks at seminars and research conferences

*Seminars*

"Anti-Dürer conjecture", Geometric Seminar, MCCME, Moscow, Russia, May 24, 2007.

"Anti-Dürer conjecture for nonconvex polytopes", Seminar on Combinatorial Computing, NYU, May 14, 2008.

"Minimal triangulations of cubes", Saint Petersburg Geometric Seminar, St. Petersburg Department of Steklov Institute of Mathematics of Russian Academy of Sciences, May, 2009.

"On properties of polyhedral complexes and subdivisions", seminars "Discrete Geometry and Geometry of Numbers", "Algebraic Topology and Applications", "Number Theory", "Contemporary Geometric Methods", "Arithmetic and Geometry", "Differential Geometry and Applications", Moscow State University, Fall 2009.

"Lower bounds for the cube simplicity", Discrete Geometry and Combinatorics Seminar at Cornell University, November 15, 2010.

"Sets with few distances", Geometry & Topology Seminar, IST Austria, January 18, 2018.

"Optimal codes in projective spaces", Discrete and Computational Geometry Seminar, Institute for Information Transmission Problems, Russian Academy of Sciences, Moscow, Russia, May 28, 2019.

"Mapping to the space of spherical harmonics", Point Distributions Webinar, in Zoom, November 11, 2020.

"Domes over curves", joint session of the Postnikov Seminar and "Discrete Geometry and Geometry of Numbers", Moscow State University, in Zoom, February 16 and April 6, 2021.

"Covering by polynomial planks", Algebra / Number Theory / Combinatorics Seminar, Claremont Colleges, in Zoom, April 5, 2022.

Various talks at Mathematics Research Seminar, The University of Texas at Brownsville, 2010-2015, and Pure Math Seminar, The University of Texas Rio Grande Valley, 2015-.

### *Conferences and Workshops*

"Triangulations of 2-layers polytopes", Second COE Workshop on Sphere Packings, Fukuoka, Japan, May 30 - June 3, 2005.

"On triangulation of prismoids", ISM Symposium Packing and Random Packing, Tokyo, Japan, March 1-3, 2006.

"On new property of polyhedral tilings", Ninth International Seminar "Discrete Mathematics and its Applications", Moscow State University, Russia, June, 2007.

"Anti-Dürer conjecture for nonconvex polytopes", 10th International Conference on Convexity and Discrete Mathematics, Dortmund, Germany, August, 2007.

"Lonely vertex theorem", the 17th Annual Meeting of the South Texas Mathematics Consortium, Edinburg, TX, February 21, 2009.

"The status of the extreme spheres theorem" and "New asymptotic bounds for cube triangulations", The Discrete Geometry Workshop, South Padre Island, TX, April 16-19, 2009.

"Minimal triangulations of cubes", Discrete Geometry and Statistics of Configurations, Moscow, June, 2009.

"Lower bounds for the cube simplicity", Topology, Geometry, and Dynamics: Rokhlin Memorial, Euler International Mathematical Institute of Russian Academy of Sciences, Saint-Petersburg, Russia, January 11-16, 2010.

"Lower bounds for cube triangulations", Culminating workshop of the special program on discrete and computational geometry at the Bernoulli Centre at École Polytechnique Fédérale de Lausanne. November 29 - December 3, 2010.

"On simplicial dissections of simplotopes", AMS Special Session on Discrete Geometry and Algebraic Combinatorics, Joint Mathematics Meetings, San Diego, January 9-12, 2013.

"Optimality of functionals on Delaunay triangulations" (poster presentation), Workshop on Distance Geometry and Applications, Manaus, Brazil, June 24-27, 2013.

"The price of SDP relaxations for spherical codes", the 2nd Joint Conference on Designs, Codes, Graphs and Related Areas, The Research Institute for Mathematical Sciences Joint Research, RIMS, Kyoto University, Japan, July 1-3, 2013.

"On diameter graphs", Second Summer School, Delaunay Laboratory "Discrete and Computational Geometry", July 22 - August 2, 2013.

"Optimal properties of Delaunay triangulations", Geometry and Topology, Institute for Information Transmission Problems of Russian Academy of Sciences, Moscow, February 10-11, 2014.

"On the total perimeter of disjoint convex bodies", AMS Special Session on Recent Advances in Discrete and Intuitive Geometry, Joint Mathematics Meetings, San Antonio, January 10-13, 2015.

"Spherical embeddings of strongly regular graphs", Algebraic Combinatorics and Applications, The first annual Kliakhandler Conference, Michigan Technological University, Houghton, Michigan, August 26-30, 2015.

"Linear and semidefinite relaxations for spherical codes", The Fifth German-Russian Week of the Young Researcher on Discrete Geometry, Moscow Institute of Physics and Technology, Dolgoprudny, Russia, September 7-11, 2015.

"Strongly regular graphs and spherical configurations", AMS Spring Southeastern Sectional Meeting, Athens, Georgia, March 5-6, 2016.

"On perimeters of disjoint convex polygons", Discrete Geometry workshop, Auburn University, Auburn, Alabama, March 8-9, 2016.

"Contact graphs of balls" (poster presentation), Informal Analysis Seminar, Kent State University, Ohio, April 30 - May 1, 2016.

"Contact graphs of ball packings", Joint Mathematics Meetings, AMS Special Session Discrete Geometry and Convexity, Atlanta, Georgia, January 4-7, 2017.

"Average degrees in sphere packings", Mathematical Congress of the Americas, Montreal, Canada, July 24-28, 2017.

"Sets with few distances and their optimality", Computation and Optimization of Energy, Packing, and Covering, ICERM, Brown University, April 9-13, 2018.

"Covering with convex homothets", AMS Spring Eastern Sectional Meeting, Northeastern University, April 21-22, 2018.

"Optimal spherical antipodal point sets", AMS Spring Southeastern Sectional Meeting, Auburn University, March 15-17, 2019.

"Packings of spherical particles", COS Conference, UTRGV, March 29, 2019.

"Optimal projective codes", Optimal Point Configurations and Potential Theory, CIEM Castro Urdiales, Cantabria, Spain, April 8-11, 2019.

"Domes over curves", Combinatorics and Geometry Days III at MIPT, in Zoom, December 2-4, 2020.

"Linear programming bounds revisited", Recent aspects of sphere packings minisymposium, CanaDAM 2021, in Zoom, May 26-27, 2021

"Price of SDP relaxations for spherical codes", Optimal measures and point configurations minisymposium, 4<sup>th</sup> Annual Meeting of the SIAM Texas-Louisiana Section, South Padre Island, Texas, November 5-7, 2021.

"Optimal point configurations and measures for multivariate geometric potentials", Optimal Point Configurations on Manifolds, Erwin Schrödinger International Institute for Mathematics and Physics, University of Vienna (hybrid meeting), January 10-21, 2022.

"Covering by polynomial planks", Workshop on Algebraic Combinatorics, National Center for Theoretical Sciences (NCTS) at National Taiwan University (online meeting), January 24-26, 2022.

"Domes over curves", AMS Spring Eastern Sectional Meeting (online meeting), March 19-20, 2022.

"Optimal measures for  $p$ -frame energies on spheres", Random Matrix EurAsia 2022 (online meeting), April 28, 2022.

"Optimal spherical measures approximating the uniform distribution", MCQMC 2022, July 17-22, 2022.

## Conferences, workshops attended, short-term visits

### *Research conferences and workshops attended*

Third Voronoi Conference on Analytic Number Theory and Spatial Tessellations. Institute of Mathematics of Ukrainian Academy of Sciences, Kyiv, Ukraine, September 22-28, 2003.

Workshop on Discrete Geometry, Thematic Program on Discrete Geometry and Applications, Fields Institute, Toronto, Canada, September 16, 2011.

Conference on Discrete Geometry and Optimization, Thematic Program on Discrete Geometry and Applications, Fields Institute, Toronto, Canada, September 19-23, 2011.

Workshop I: Combinatorial Geometry Problems at the Algebraic Interface, IPAM, UCLA, March 24-28, 2014.

Workshop IV: Finding Algebraic Structures in Extremal Combinatorial Configurations, IPAM, UCLA, May 19-23, 2014.

International Congress of Mathematicians 2014, Seoul, Korea, August 12-21, 2014.

Geometric and Enumerative Combinatorics, IMA, University of Minnesota, November 10-13, 2014.

Crystals, Quasicrystals and Random Networks, ICERM, Brown University, February 9-13, 2015.

Arbeitsgemeinschaft: Mathematical Quasicrystals, Mathematical Research Institute of Oberwolfach, Germany, October 4-9, 2015.

Summer school "Transversal aspects of tilings", Oleron, CAES du CNRS, France, June 5-18, 2016.

Conference "Mathematics of Jiří Matoušek", Charles University, Prague, Czech Republic, July 23-28, 2016.

Soft packings, nested clusters, and condensed matter, AIM, San Jose, September 19-23, 2016.

Geometric and topological combinatorics: Modern techniques and methods, MSRI, UC Berkeley, October 9-13, 2017.

Statistics for Data with Geometric Structure, Oberwolfach, Germany, January 21-27, 2018.

Informal Analysis Seminar, Kent State University, Ohio, February 24-25, 2018.

Optimal and Random Point Configurations, ICERM, Brown University, February 26 - March 2, 2018.

Fast Algorithms for Generating Static and Dynamically Changing Point Configurations, ICERM, Brown University, March 12-16, 2018.

Workshop on Coding and Information Theory, CMSA, Harvard University, April 9-13, 2018.

Computational Challenges in the Theory of Lattices, ICERM, Brown University, April 23-27, 2018.

International Congress of Mathematicians, Rio de Janeiro, Brazil, August, 1-9, 2018.

Discrete geometry and automorphic forms, AIM, San Jose, September 24-28, 2018.

Soft Packings, Nested Clusters, and Condensed Matter, Casa Mathematica Oaxaca, Mexico, September 29 - October 4, 2019.

Helly and Tverberg type Theorems, Casa Mathematica Oaxaca, Mexico, October 6-11, 2019.



*Teaching conferences and workshops attended*

Challenge-Based Instruction Faculty Development Workshop, Brownsville, March 23 and March 30-31, 2013.

Challenge-Based Instruction Faculty Development Workshop, Brownsville, April 4-5, 2014.

Workshop on Inquiry Based Learning (IBL) in Mathematics, Brownsville, July 11, 2015.

Apply the Quality Matters Rubric workshop, Brownsville, September 9, 2016.

Course Blueprinting workshop, online, July 8 - August 14, 2020.

*Short-term visits*

The Institute of Statistical Mathematics (host – Yoshiaki Itoh), Tokyo, Japan, February 23 - March 8, 2006.

Bernoulli Centre at École Polytechnique Fédérale de Lausanne (Special Program on Discrete and Computational Geometry), Switzerland, November 20 - December 18, 2010.

Institute of Science and Technology Austria (host – Herbert Edelsbrunner), November 23-29, 2013.

Institute of Science and Technology Austria (host – Herbert Edelsbrunner), January 5-20, 2018.

**Synergistic Activities**

Jury of the All-Russian Mathematical Olympiad (all stages) (2002-2007)

Jury of the Russian Team Selection Test (2002-2007)

Coach of the Russian National Team to the International Mathematical Olympiad (2002-2011, 2013, 2016)

Organizer of the Discrete Geometry and Algebraic Combinatorics Conferences on South Padre Island, TX (2008-10, 2012-2019) (see <http://blue.utb.edu/dg2013/15>, <http://www.utrgv.edu/discgeo/>)

Organizer of public mathematical lectures for high school students and math majors (2012-2015, 2017)

Organizer and proctor of American Mathematics Competitions in the Rio Grande Valley, TX (2010-2014)

Organizer of Math Clubs in Brownsville, TX (2010)

Coach of the Math and Science Academy and other Rio Grande Valley students for math competitions (2010-2016)

Organizer of the AMS Special Session on Frames, Designs, and Optimal Spherical Configurations at the Joint Mathematics Meetings (Denver) (2020)

Problem coordinator at the International Mathematical Olympiad (2020, 2021)

Organizer of the minisymposium at the 4<sup>th</sup> Annual Meeting of the SIAM Texas-Louisiana Section (South Padre Island, Texas) (2021)

Organizer of Combinatorics and Geometry of Convex Polyhedra at the Simons Center for Geometry and Physics (2023)

## Teaching Experience

### *High school teaching:*

Mathematical classes, School #5, Dolgoprudny, Russia (2001-2007)

Summer Mathematical School, Maykop, Russia (2004, 2005)

### *The University of Texas at Brownsville:*

Fall 2010

Calculus I (undergraduate, 2 sections)

Spring 2011

Calculus I (undergraduate, 1 section)

Geometry I (undergraduate, 1 section)

Geometry II (undergraduate, 1 section)

Group Theory (graduate, independent studies, 1 student)

Summer II 2011

College Algebra (undergraduate, 1 section)

Calculus I (undergraduate, 1 section)

Fall 2011

Precalculus (undergraduate, 1 section)

Calculus II (undergraduate, 1 section)

Geometry I (undergraduate, 1 section)

Geometry II (undergraduate, independent studies, 2 students)

Spring 2012

Stochastic Analysis (graduate, 1 section, hybrid)

Complex Analysis (undergraduate, 1 section)

Fall 2012

Calculus I (undergraduate, 2 sections)

Graph Theory (graduate, 1 section, hybrid)

Research Seminar (graduate, 1 student – Francisco Castillo "Bertrand's Postulate I")

Thesis (graduate, 1 student – David Boon)

Linear Algebra (undergraduate, independent studies, 1 student)

Winter 2013

Research Seminar (graduate, 1 student – Mauricio Flores "Fredholm's theorems")

Foundations of Mathematics (undergraduate, independent studies, 1 student)

## Spring 2013

Foundations of Mathematics (undergraduate, 1 section)

Real Analysis (undergraduate, 1 section)

Research Seminar (graduate, 2 students – Francisco Castillo "Bertrand's Postulate II", Mauricio Flores "Lax-Milgram theorem and related results")

Thesis (graduate, 1 student – David Boon "The connective constant of three-dimensional lattice graphs")

Advanced Linear Algebra (undergraduate, independent studies, 2 students)

Geometry II (undergraduate, independent studies, 1 student)

## Fall 2013

Calculus II (undergraduate, 1 section)

Geometry I (undergraduate, 1 section)

Contemporary Geometry (graduate, 1 section, hybrid)

Codes, Cyphers, and Security in Communications (graduate, independent studies, 3 students, online)

Graph Theory (graduate, independent studies, 3 students, online)

Number Theory (graduate, independent studies, 1 student)

Research Experience in Mathematics (undergraduate, 1 student – Manuel Rivera "Stirling's formula")

## Spring 2014

Calculus II (undergraduate, 1 section)

Geometry II (undergraduate, 1 section)

Mathematical Statistics (graduate, 1 section, hybrid)

## Summer Long and Summer I 2014

Contemporary Geometry (graduate, 2 sections of cohorts)

Number Theory (graduate, independent studies, 1 student)

Contemporary Geometry (graduate, independent studies, 1 student)

Research Seminar (graduate, 1 student – Krystal Monk "Poincare disk model in GeoGebra")

## Fall 2014

Geometry I (undergraduate, 1 section)

Foundations of Mathematics (graduate, 2 sections, 1 section online)

Research Experience in Mathematics (undergraduate, 2 students – Brenda Martinez "Poncelet's theorem", Jose Eduardo Mejia "Game theory: Nash equilibrium")

Research Seminar (graduate, 2 students – Erick Gonzalez "Menelaus' theorem", Ming-Lei Wu "Relationships within triangles")

## Spring 2015

Foundations of Analysis (undergraduate, 1 section)

Discrete Mathematics (graduate, 2 sections, 1 section online)

Research Experience in Mathematics (undergraduate, 1 student – Ramon Garcia "Hook-length formula")

Foundations of Mathematics (graduate, independent studies, 4 students)

Contemporary Geometry (graduate, independent studies, 1 student)

Summer I and II 2015

Graph Theory (graduate, 3 sections, 2 sections of cohorts and 1 section online)

Research Seminar (graduate, 5 students – Erick Gonzalez "Feuerbach hyperbolas", Brenda Martinez, Jaime Hurtado "Linear programming model", Sarah Orbesen "Mathematical models of electrical neuron activity", John Ebert "Constructing representations with the Peter-Weyl theorem")

*The University of Texas Rio Grande Valley:*

Fall 2015

Linear Algebra (graduate, online)

Contemporary Geometry (graduate, hybrid)

Master's Project (graduate, 2 students – Karen Gonzalez "Monks' theorem", Brenda Martinez "Borsuk's conjecture")

Research Experience in Math (undergraduate, 2 students – Armando Cortez "Is it associative?" (Randomized algorithm for checking associativity), Leslie Danache "Hilbert's third problem")

Spring 2016

Discrete Mathematics (undergraduate)

Master's Project (graduate, 2 students – John Ebert "Homology functor", Jordy Lopez "Baker-Campbell-Hausdorff formula")

Fall 2016

Discrete Mathematics (undergraduate)

Linear Algebra (graduate, online)

Research Experience in Math (undergraduate, 1 student – Pricilla Mendez "Reed-Solomon and Hadamard codes")

Spring 2017

Modern Geometry I (undergraduate)

Research Experience in Math (undergraduate, 1 student – Ronald Sanchez "Some properties of the parabola")

Master's Project (graduate, 1 student – Jonathan Kidd "Gödel and the Incompleteness Theorems")

Summer I 2017

College Algebra (undergraduate, 1 section, online)

Calculus II (undergraduate, 1 section)

Discrete Mathematics (graduate, independent studies, online, 3 students)

Special Topics in Mathematics (graduate, independent studies, 1 student)

Fall 2017

Modern Geometry I (undergraduate, 1 section)

Master's Project (graduate, 1 student – Manuel Rivera "Volume change under bending")

## Summer I 2018

Linear Algebra (undergraduate, 1 section)

History of Mathematics (undergraduate, 1 section, online)

Topology (undergraduate, 1 section, online)

Thesis (graduate, 1 student – Eduardo Ramirez)

## Fall 2018

Linear Algebra (undergraduate, 1 section)

Analysis I (graduate, 1 section, hybrid)

Thesis (graduate, 1 student – Eduardo Ramirez "Contact numbers for packing of spherical particles")

## Summer II 2019

Calculus II (undergraduate, 1 section)

Modern Geometry I (undergraduate, 1 section, ITV)

## Fall 2019

Algebra I (graduate, 1 section, online)

## Spring 2020

Mathematics of Chess (Special Topics in Mathematics) (undergraduate, 1 section, ITV)

Differential Equations (undergraduate, 1 section)

## Summer I 2020

Calculus II (undergraduate, 1 section, online)

## Fall 2020

Algebra I (graduate, 1 section, online)

Precalculus (undergraduate, 1 section, online)

Math Project (undergraduate, 2 students – Allison Osornio "Nash Equilibrium", Veronica Cabello Calderon "Classic Nim Game")

## Spring 2021

Differential Equations (undergraduate, 1 section, online)

Math Project (undergraduate, 1 student – Jaqueline Resendez "Matrix Multiplication")

## Summer Module 1 2021

Contemporary Geometry (graduate, 1 section, accelerated, online)

## Summer III 2021

Complex Variables (undergraduate, 1 section, online)

## Fall 2021 Module 1

Discrete Mathematics (graduate, 1 section, accelerated, online)

## Fall 2021

Calculus II (undergraduate, 1 section, hybrid)

Differential Equations (undergraduate, 1 section, hybrid)

Math Project (undergraduate, 2 students – Yamilex Hernandez "Fibonacci Nim", Jose Montini "Counting Pólya's Alcohols")

Spring 2022

Research Experience in Mathematics (undergraduate, 1 student – Jose Montini "Covering by Planks")

Fall 2022

Differential Equations (undergraduate, 1 section, hybrid)

Spring 2023

Mathematics of Chess (Special Topics in Mathematics) (undergraduate, 1 section, hybrid)

Summer I 2023

Elementary Cryptology (undergraduate, 1 section, online)

Fall 2023

Differential Equations (undergraduate, 1 section, hybrid)

Topology (graduate, 1 section, hybrid)

## Service

Maintaining the departmental website (2012-2014)

College Scholarship Committee (chair – 2012-2014; member – 2014-2015); scholarships liaison of the Department of Mathematics (2012-2015)

College Undergraduate Curriculum Committee (member – 2013-2015); Mathematics Undergraduate Curriculum Committee (member – 2012-2013, 2016-2017, chair – 2013-2015)

Mathematics Graduate Curriculum Committee (member – 2012-2015)

Leading academic advisor for the Department of Mathematics (2012-2013)

College Assessment Committee (member – 2013-2015, 2016-2017); undergraduate academic assessment liaison of the Department of Mathematics (2013-2015)

SMSS Assessment Committee (chair – 2015-2023)

Core Math Courses Assessment Committee (chair – 2018-2019)

Tenure and Tenure-track Search Committees (member – 2013, 2014, 2015 (partially), 2022-2023, co-chair – 2016)

One-Year Lecturers Search Committee (member – 2017)

Three-Year Lecturers Search Committee (member – 2019-2020)

Affirmative Action Advocate for Biology Search Committee (substitute – 2015)

Participation in developing an articulation agreement with Voronezh State University, Russia; designated liaison for the double degree of graduate studies in mathematics with Voronezh State University (2014-2015)

Annual Evaluation Committee (member – 2015-2016, 2022-2023, co-chair – 2016-2017)

Ph.D. Planning Committee (member – 2015-2017)

Scholarship Committee (member – 2017-2018, 2019-2023)

Lecturers Promotion Committee (member – 2018-2019)

Colloquium & Distinguished Lecture Series Committee (member – 2018-2021, chair – 2021-2023)

Comprehensive Exam Committee for Program Assessment (member – 2018-2023)

Coastal Bend Mathematics and Statistics Conference Organizing Committee (member – 2018-2019)

Annual Evaluation Criteria Revision Committee (member – 2020-2022)

Organizer of the Seminar in Brownsville (2023)

UTRGV Assessment Working Group (member – 2022-2023)

Last updated: August 31, 2023