

**Computer and Information Science**  
**CISC 3620: Computer Graphics**  
**Spring, 2020**  
**(3 hours, 3 credits)**

**Description** Fundamentals of computer graphics programming. Graphics hardware and software standards. 2D geometric primitives and raster images. 3D object representations. Data structures, algorithms, and the graphics pipeline. Graphical user interfaces. Underlying concepts in computer graphics systems, including games, animation, modeling, rendering, and paint systems.

**Instructor: Prof. Michael Mandel**

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**Phone** 718-951-5000 x2053

**Office** Ingersoll 2232

**Web** <http://mr-pc.org>

**Office hours** Tuesday 3:30–5:00pm, Thursday 12:45–2:05pm and by appointment

**Course meetings** Tuesdays and Thursdays, 2:05–3:30pm, New Ingersoll 432

**Prerequisites** Computer and Information Science 3130; and Mathematics 1011 or 1026 or assignment to Mathematics \*1201 by the Department of Mathematics.

**Main textbook (required)**

- J. Dirksen. Learn Three.js: Programming 3D Animations And Visualizations For The Web With HTML5 And WebGL, 3rd Edition. Packt Publishing, 2018. ISBN: 978-1788833288.

**Additional textbooks (optional)**

- E. Angel and D. Shreiner. Interactive Computer Graphics With WebGL, 7th Edition. Pearson, 2016. ISBN: 978-0133574845.
- P. Shirley and S. Marschner. Fundamentals of Computer Graphics, 3rd Edition. CRC Press, 2009.
- F. Dunn and I. Parberry. 3D Math Primer for Graphics and Game Development, 2nd Edition. CRC Press, 2011.

**Grading** The course will be graded on a curve, with the final grade computed by weighting assignments as follows:

Participation / attendance	10%
Homeworks (x6)	5%
Midterm	30%
Final exam	30%

All homeworks should be turned in via blackboard at least 30 minutes prior to the beginning of the corresponding class period. Homeworks turned in late will be penalized 10% for each day or fraction of a day they are late. For example, an assignment that is turned in one day and one hour after the deadline and would have received a 90% will instead receive an 70% since it is more than one day late.

Attending class is mandatory and attendance will be taken at the beginning of every meeting. Students arriving after class has begun will receive half credit for attendance for that day. This rule does not apply to absences due to religious observances, as described on page 72 of the Undergraduate Bulletin.

**Online Resources** Slides, assignments, and readings will be posted on the course website:

<http://mr-pc.org/t/cisc3620/>

The course will also have a blackboard site with a dropbox for each assignment, grades, and announcements.

## Course Topics

1. Canvas drawing
2. WebGL, Three.js
3. User controls and color
4. HLS and triangle interpolation
5. Instance transforms, Composite objects, Nested transforms
6. Cameras
7. Materials and lighting
8. Texture mapping
9. Animation
10. Bezier surfaces, Lathe, Extrude, Tube geometries
11. Interaction
12. Transparency and text
13. Shadows and anti-aliasing
14. Blowing cloth, sprites, points

**Key Dates** There will be a midterm exam in class on March 19, 2019 and a final exam during finals period on May 19, 2019. Please see the course website for a list of all assignment due dates.

**University policy on Academic Integrity** The faculty and administration of Brooklyn College support an environment free from cheating and plagiarism. Each student is responsible for being aware of what constitutes cheating and plagiarism and for avoiding both. The complete text of the CUNY Academic Integrity Policy and the Brooklyn College procedure for policy implementation can be found at <http://www.brooklyn.cuny.edu/bc/policies>. If a faculty member suspects a violation of academic integrity and, upon investigation, confirms that violation, or if the student admits the violation, the faculty member **MUST** report the violation.

**Course policy on Academic Integrity** While you are encouraged to discuss the course material and assignments with your classmates and anyone else you might like, all submitted assignments must be *strictly your own work*. If you include any work from other sources, including web pages, stack overflow, publications, books, or conversations, it should be explicitly cited with proper credit given to the original author and a link to it if it is online. If you allow a classmate to copy from you, both you and your classmate will be penalized.

**Center for Student Disability Services** In order to receive disability-related academic accommodations, students must first be registered with the Center for Student Disability Services. Students who have a documented disability or suspect they may have a disability are invited to setup an appointment with the Director of the Center for Student Disability Services, Ms. Valerie Stewart-Lovell at (718) 951-5538. If you have already registered with the Center for Student Disability Services, please provide your professor with the course accommodation form and discuss your specific accommodations with him.

**Email correspondence** I will regularly use e-mail to send out announcements, changes in the syllabus, reminders about tests or due dates, etc. It is your responsibility to check e-mail regularly to keep up-to-date with these announcements. I will use the e-mail address you have listed with the College. Therefore, please make sure that this is indeed the correct address.

Please include the course number (CISC 3620) in the subject line of any email you send to me. I have a filter setup that flags any such email as important and I am sure to see it quickly. If you don't, it might take me longer to respond. Please make sure that your full name is clearly visible, either in your email address or in the signature.