In CHM 11200, General Chemistry II, the following topics will be covered:

- Intermolecular forces; solutions and their physical properties.
- Rates of chemical reactions, known as kinetics, and the quantitative application of zero-order, first-order, and second-order kinetics concepts to understand the factors that control rates of reaction.
- Acids, bases, and buffers. Many disciplines use these concepts and chemists have developed different kinds of models to describe acids and bases. We will focus on acid-base reactions, equilibria, and the application of quantitative equilibrium concepts to such reactions. Buffers have important applications in agriculture and in health sciences which will be explored.
- Oxidation-reduction reactions. Electrochemical cells, cell potentials, and energy changes associated with reactions in electrochemical cells.
- An overview of organic compounds and biologically important molecules.

The Chemistry 11200 team—the professor, graduate teaching assistant, administrative assistants, and general chemistry preparations lab—are committed to helping you learn chemistry. Please read on to learn about the required materials, lecture and lab schedule, recommended ways to study, lab policies, grading, and other course policies and procedures.

Course Learning Objectives will be provided in lecture and on Blackboard.

BRWN 1144, The General Chemistry Office, 49-45250 The General Chemistry office handles all the administrative details associated with the course, such as clarification of course policies, resolving grade issues, schedule changes, and signatures on university forms such as add/drop forms, should be directed to this office. Assistants Mrs. Linn and Mrs. Roadruck are able to help you with a variety of requests so you can maximize your success in general chemistry.

Lab Supervisor Kathleen Jeffery, BRWN 1144, phone: 49-45250; kjeffery@purdue.edu. Kathleen Jeffery will be available in BRWN 1144 during lab if laboratory assistance is needed.


Lecture outlines, reading assignments, announcements, and other course information are available on the course Blackboard page. We recommended you visit it often.

***For additional information, including Purdue University Policies, Sources of Help, Ways to Study Chemistry, and Safety Policies, see the “Course Information” folder on the course Blackboard page. ***
Required Materials

Textbook: The textbook I have chosen for you is Burdge, Chemistry, 4th edition (ISBN: 9781259973079). I have also chosen the McGraw-Hill Connect online homework program for our homework platform. When you purchase Connect it includes an electronic copy of the textbook, Burdge, Chemistry, 4th edition (ISBN: 9781259973079). You can purchase Connect from the University bookstores or directly through McGraw-Hill (it is cheaper directly from McGraw-Hill because the bookstore adds a small markup to the McGraw-Hill price). If you would like a physical textbook (loose-leaf version) as well, you must purchase Connect directly through McGraw-Hill online (ISBN: 9781259973086). If you are using an old book (any edition) you will still need to purchase access to the Connect program and that will automatically include an electronic copy of the text. A link on the course Blackboard page will direct you to the McGraw-Hill site where you can make your purchases. **Students who completed CHM 11100 or CHM 11200 in Fall 2016 or Spring 2017 already have the necessary Connect access. If you completed CHM 11100 or CHM 11200 in an earlier semester at Purdue, contact Dr. Harwood for more information.**


i-Clicker: The i-Clicker response system will be used this semester for extra credit.

Calculator: A simple battery operated scientific calculator with exponential, logarithm and square root functions will be needed for exams. Two-line non-programmable calculators are allowed. Alpha-numeric and programmable calculators will NOT be allowed for exams.

Lab Materials: The *Chemistry 11200 Laboratory Manual*, a Sharpie™ (black, permanent ink) for marking lab glassware, a padlock for your assigned lab drawer, an electronic storage device for lab data, and approved safety goggles, available at the bookstores or from the storeroom on the 1st or 2nd floor in BRWN.

Week #1 Assignments:

- Purchase required materials (see above).
- Register for your CONNECT account.
- Read all the information in this course packet.
- Read the Reading Assignments and Learning Objectives (on Blackboard).
- Complete the safety certification available on the course Blackboard page with a score of at least 20/25. You will complete your safety certification during lab check-in Week 1. **You must complete your safety certification before you can work in lab after check-in.**
- Attend recitation, lecture, and laboratory check-in.

Weekly Assignments:
(Also refer to the “Some Ways to Study Chemistry” on the course Blackboard page.)

- Attend lecture, recitation, and lab.
- Complete the reading assignment before lecture (see lab/lecture schedule, pp. 9-10).
- Complete your Connect homework assignment (due each Sunday at 11:59 pm).
- Prepare for lab: read the relevant lab manual chapter, do the textbook reading assignment for lab (see lab/lecture schedule), and complete the pre-lab exercises including the lab procedure outline.
Overview of CHM 11200 Activities and Policies
***For more detailed information, see the course Blackboard page. ***

How to Study for CHM 11200  (written by Dr. John Nash and Dr. Marcy Towns)
It will take you at least two hours out of class for every hour we spend in class in order to study and learn the material. This means about 8-12 hours of distraction-free studying and working with chemistry each week. You may spend this time working on your lecture notes, reading the text, studying the required material, doing homework, studying for exams, or other things. You may find yourself spending more than 8-12 hours per week if your math skills need improvement or if it has been a few years since you took a chemistry course. If you are committed to your goals and dreams, then dedicate yourself to spending the necessary time to study and do well.

Before Class
• Complete the assigned reading (given in lecture) and review your notes from the previous class.

During Class
• Take notes!
• Write down each step of every problem or example even if you do not understand the step. You can always ask about it later.
• Try to answer all the questions that the professor presents.
• Write a question mark next to things you don't understand so you can return to them after class.
• Use shorthand or abbreviations so that you can write quickly, but understandably.

After Class
• Review your notes while things are still fresh in your mind.
• Check your text in order to understand those items that you did not understand and marked in lecture. If necessary, use graduate instructor (TA) office hours to help you.
• Never miss lecture. Chemistry is cumulative. What is presented tomorrow depends upon your knowledge of what was covered today. If you will miss class, then get a friend to take notes for you or get the notes from the Boilercast recording.
• Listen to the Boilercast lecture recordings on Blackboard to fill in things you missed.

Read Differently
• Read technical material (like your Chemistry textbook) differently than you would read a novel. Read in short “chunks” and give yourself time to reflect and interpret the information presented. With technical material, it is often difficult to pick up the “story” in the second paragraph if you did not process the first paragraph.
• Try the problems in the book without looking at the solutions! If you have understood what you’ve read, then you should be able to do the problems. First, cover the solution and try the problem. Second, quickly look at the answer to see if you are correct. If your answer is incorrect, try re-reading the section to see if you missed anything. Third, look at your work again to find your mistake. Fourth, look at the solution of the problem presented in the book. The key is to force yourself to recall and apply material.
• Read technical material in a “distraction free” environment. Processing technical information will be more effective in the absence of TVs, radios, headsets, etc. Turn your phone off!
• Read and interpret subheadings. With technical material, the subheadings often carry important information. This is different from the chapter headings in a novel which usually contain no information.
• Use the textbook as a reference when you study your lecture notes. Fill in any gaps and correct any information.
When Should I do the Homework?

- Do some work in chemistry every day. Work at least two chemistry problems each day. If you are drawing a blank about the problem after 5-10 minutes, go on to another problem. Seek help from a graduate instructor (TA) the next day during office hours. After a day or so, work related problems in the textbook.
- Read the assigned pages in the textbook before you attempt any of your homework problems.

Practice, Practice, Practice

- Work additional problems at the end of each chapter which were not assigned as homework.
- Look for similarities and differences in problems (homework questions, lecture examples). Classify problems by the type of knowledge that is needed to solve the problem.

Sources of Help

There are free sources of help for CHM 11200 students, including professor office hours and TA office hours (BRWN 1106). Find more information in the “Resources” folder on Blackboard.

Reading

See the lecture schedule for the reading assignments. Reading the assigned material prior to lecture and laboratory is expected. Some of the material will be covered in lecture and some on your own. Reading assignments and learning objectives will also be posted on Blackboard.

Lectures

- Student versions of the lecture notes will be posted on Blackboard prior to each lecture. These are not verbatim copies of the lectures, but are outlines of the lectures. Audio recordings and video capture of lecture slides can be downloaded from the Boilercast website (http://www.itap.purdue.edu/tlt/BoilerCast/).
- You will be expected to participate in problem-solving activities during lecture. These will generally be conducted in small group within the lecture and provide you more opportunities to interact with the concepts and communicate your understanding.
- Cell phones, computers or other electronic devices not being used for instruction purposes are distracting for everyone in a learning situation. Please respect your classmates and turn off your cell phones and iPods in lectures as well as in recitations and labs. Computers can be used to take notes and follow lecture, but you should not be using Facebook, texting, etc. during class. Talking out loud to classmates during lecture is distracting to other students and is disrespectful to the lecturer. If you have a question please ask, but otherwise remain quiet and allow the students around you the opportunity to pay attention.

PSO (Practice, Study, Observation)

Your teaching assistant facilitates a bi-weekly recitation designed to help you understand laboratories that week and to discuss any questions you may have from lecture or the homework. You will have time to ask questions and check your homework and pre-lab answers so take your homework questions and lab manual with you to recitation.

Homework (CONNECT)

- Each week you will have one homework assignment on the online Connect system (see Blackboard for the link). The homework will be due on Sunday at 11:59 pm. Late homework is not accepted. Your lowest homework score for the semester will be dropped.
- Each homework assignment will be worth 15 points. The best 7 of 8 homework scores will be used at the end of the semester.
- No time extensions are possible for homework assignments.

Laboratory
Laboratory exercises are an integral part of CHM 11200 and are an opportunity for you to experience in a hands-on way the chemical concepts discussed in lecture.

- Lab attendance is required since CHM 11200 is a laboratory course. There are no make-up labs or excused absences, except those covered by the GAPS (grief absence) and MAPS (military absence) policies.
- You are required to complete 9 of the 11 scheduled lab projects to pass the course. If you fail to complete more than 2 lab projects, an automatic grade of “F” will be assigned for the course at the end of the semester.
- You must complete the online safety certification found on Blackboard with a score of 20/25 or better before the first lab experiment (Lab 1) on June 15, 2017. The safety certification score is not part of your course grade.
- Before lab, read the experiment and attend recitation to help you prepare.
- Complete the pre-lab exercises and prepare an experimental procedure in your lab notebook before coming to lab. Pre-labs are due at the beginning of the lab period.
- Arrive on time, properly dressed, and prepared for lab work.

**Appropriate Clothing** Chemistry department regulations state that you must wear clothing in the lab that protects your skin from your neck to your ankles and feet when you are sitting, standing or reaching. Shoes that cover your feet entirely are required. The best option for chemistry lab attire is a t-shirt, jeans without holes, and sneakers with socks. **If you attend lab in unacceptable attire, you will be sent home and receive a zero for the lab. This counts as a “fail to complete” lab.**

**Unacceptable** clothing includes, but is not limited to:
- tops that are sleeveless, low-cut or V-neck (below the collar bone), bare midriff or tank-style
- pants that are ripped or have holes in the fabric of any size
- tights or thin (translucent or transparent) leggings
- Capris, cropped pants, or shorts
- short skirts
- open-toed and/or open-heeled shoes (including Crocs, Birkenstocks or other clogs)
- sandals (with or without socks)
- **boat shoes**, ballet flats, slippers, moccasins, or any shoe that doesn’t cover the entire top of your foot, with or without socks

- If you arrive in lab more than 10 minutes late or improperly dressed, will be asked to leave
the lab and will receive a score of zero for that laboratory. This counts as one of your “fail to complete” labs.

- Endeavor to work as an effective member of the team.
- Complete the lab report appropriately:
  - Use pen and write neatly.
  - Label graphs and tables.
  - Use the data you collected for the calculations and analysis.
  - Use correct units of measurement and significant figures.
  - Use chemical terms and concepts correctly.
  - Ensure results and conclusions are consistent with your data and observations.

- Lab reports are due before leaving lab the day lab work is completed and the lab is closed, that is 5:00 PM. Lab reports must be turned in to receive any points for lab.
- Graded lab reports will be returned one week after they are submitted. If you have questions about your grade, speak with your lab instructor or the course coordinator.

Safety

Students’ safety in the laboratory is a priority and everyone is required to comply with the following safety regulations.

- Proper dress (clothing and shoes) and goggles are required. Refer to the detailed information on the course Blackboard page or in your Purdue custom edition textbook for what constitutes proper dress for the laboratory.
- Wear gloves when specified.
- Food and beverages are not allowed in the labs.
- If your hair is longer than shoulder length you must tie it behind your head.
- Contact lens wearers are encouraged to wear glasses in the laboratory.
- Follow your instructor’s guidance on appropriate handling of hazardous materials and disposal of chemical waste.
- Promptly clean up spills and tidy the laboratory before leaving.

Exams

Exams are a chance for you to demonstrate your comprehension of the course material and are worth approximately 56% of your final grade.

Tentative Summer 2017 hour exam schedule:

<table>
<thead>
<tr>
<th>Exam I:</th>
<th>Monday</th>
<th>June 26, 2017</th>
<th>6:30 p.m.</th>
<th>WTHR 320</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exam II:</td>
<td>Monday</td>
<td>July 17, 2017</td>
<td>6:30 p.m.</td>
<td>WTHR 320</td>
</tr>
</tbody>
</table>

Final Exam: time and place to be announced – see below

- Attendance at exams is required. There are NO make-up exams and absences are not excused except those covered by the GAPS and MAPS policies. You will receive no score (zero points) for any missed exams.
- If you have a direct conflict with another exam, class, or required university activity, contact the General Chemistry office (BRWN 1144) at least one week before the conflict. You will be asked to provide written verification of the conflict. If an emergency occurs, contact the General Chemistry office (BRWN 1144) as soon as possible.
- Hour exams are 60 minutes in length. You should arrive at least 15 minutes before the exam start time. If you arrive more than 15 minutes late for an exam, you will not be allowed to take the exam.
- Bring an appropriate calculator (see details on the front page). You may not share a calculator with another student.
Final Exam

- The final is a 2-hour comprehensive exam. Time and place will be announced.
- Wait until you know the date of the final exam before you make travel plans that might conflict with the exam. Final exams will NOT be rescheduled to accommodate travel plans.
- University policy on Final Exams states: “Students scheduled for more than two (final) examinations in one calendar day are entitled to reschedule any examination in excess of two. It is the responsibility of the student to make necessary arrangements before the last week of regularly scheduled classes.”

Determining your Course Grade, Summer 2017

Each of the assigned course activities for CHM 11200 is worth the number of points listed below. Before course grades are finalized at the end of the semester the following scores will be dropped:
- your lowest homework score
- your lowest lab score

The total number of points for CHM 11200 (1000) will be distributed as follows:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework</td>
<td>180 pts</td>
</tr>
<tr>
<td>Labs</td>
<td>250 pts</td>
</tr>
<tr>
<td>Pipet Badge</td>
<td>10 pts</td>
</tr>
<tr>
<td>Exams (2 at 140 pts each)</td>
<td>280 pts</td>
</tr>
<tr>
<td>Final Exam (comprehensive)</td>
<td>280 pts</td>
</tr>
</tbody>
</table>

If you miss more than 2 of 11 labs, your course grade will automatically be an F. Except for approved GAPS or MAPS leaves, there are no excused absences in CHM 11200.

Extra Credit: Up to 20 points of extra credit is available during the course by answering clicker questions during class.
- Check your grades on Blackboard Learn after each exam. If there are any errors or discrepancies, notify Dr. Harwood within 2 weeks of the exam.
- Save all returned graded papers and your exams until after you have received your course letter grade for CHM 11200. To resolve any discrepancies, your paper(s) will need to be reviewed.
COURSE ACTIVITIES, POLICIES AND PROCEDURES

Changing Sections/Adding/Dropping

UNIVERSITY DEADLINES – Summer 2017
Sun., Jun 18: Last day to cancel (drop) a course without it appearing on your record.
Fri., Jun 23: Last day to cancel (drop) a course without a grade.
Wed., Jul 12: Last day to cancel (drop) a course (with a passing or failing grade).

Late Registration  If you register late, notify Dr. Harwood no later than Friday, June 23 to see about the possibility of making up missed assignments.

Lab Drawer Check-Out  If you drop CHM 11200 after having checked into a lab drawer, it is your responsibility to check-out of your assigned drawer during your scheduled lab period. Failure to check-out of lab will result in your padlock being cut, a $45 fee, and forfeiture of the right to determine the acceptability of all locker drawer equipment.

If you change sections after you check into a locker drawer, you must check out of your old locker drawer before checking into a drawer in your new section.

DISABILITY ACCOMMODATIONS
If you require accommodations to access course activities or materials, the accommodations must be described and approved by Disability Resource Center, Young Hall Room 830, 302 Wood Street, 494-1247, www.purdue.edu/drc. To implement accommodations you must follow the instructions in the letter prepared by the Disability Resource Center. Take a copy of this letter to Ms. Melissa Roadruck in BRWN 1144 within the first two (2) weeks of the semester or within one week of the date of the letter to discuss your accommodations. Timely notification of the course coordinator is critical for timely implementation.
<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Lecture Topic</th>
<th>Reading (textbook)</th>
<th>Date</th>
<th>Laboratory (T &amp; Th) (Lab Manual Chapter)</th>
<th>Exams (location)</th>
<th>Week</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>12-Jun</td>
<td>Introduction</td>
<td>Course Packet</td>
<td>12-Jun</td>
<td>Check-in; Safety Certification (Blackboard)</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>13-Jun</td>
<td>Intermolecular Forces</td>
<td>11.1: pp 484-490</td>
<td>13-Jun</td>
<td>Chromatography of Amino Acids</td>
<td>(Safety Certification must be completed before working in lab)**</td>
<td></td>
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<tr>
<td></td>
<td>15-Jun</td>
<td>Intermolecular Forces</td>
<td>11.2: pp 490-495</td>
<td>15-Jun</td>
<td>L1: <strong>(Safety Certification must be completed before working in lab)</strong></td>
<td>(Lab notebook, splash goggles, and proper clothes for lab are required.)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>16-Jun</td>
<td>Intermolecular Forces; Liquids</td>
<td>11.6: pp 509-514</td>
<td>16-Jun</td>
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<tr>
<td>2</td>
<td>20-Jun</td>
<td>Properties of Solutions; Colloids</td>
<td>13.4-13.5: pp 573-587</td>
<td>20-Jun</td>
<td>L2: Antacid Analysis (Ch 3)</td>
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<td></td>
<td>22-Jun</td>
<td>Chemical Kinetics</td>
<td>13.7: pp 590-592</td>
<td>22-Jun</td>
<td>L3: Kinetics of Smell (HO1)</td>
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<td></td>
<td>27-Jun</td>
<td>Chemical Kinetics</td>
<td>14.3-14.4: pp 620-630</td>
<td>26-Jun</td>
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<tr>
<td></td>
<td>29-Jun</td>
<td>Acids and Bases</td>
<td>14.5-14.6: pp 635-647</td>
<td>27-Jun</td>
<td>L4: Chemical Kinetics (HO2)</td>
<td></td>
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<tr>
<td>3</td>
<td>30-Jun</td>
<td>Acids and Bases</td>
<td>16.1-16.3: pp 720-725</td>
<td>29-Jun</td>
<td>L5: Synthesis and Chemiluminescence of Luminol (Ch 6)</td>
<td></td>
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<tr>
<td></td>
<td>03-Jul</td>
<td>NO CLASS</td>
<td>16.3-16.4: pp 725-734</td>
<td>30-Jun</td>
<td></td>
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<tr>
<td>4</td>
<td>04-Jul</td>
<td>FOURTH OF JULY HOLIDAY</td>
<td>16.3-16.4: pp 735-746</td>
<td>03-Jul</td>
<td></td>
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<tr>
<td></td>
<td>06-Jul</td>
<td>Acids and Bases; Chemical Equilibrium</td>
<td>04-Jul NO LAB – FOURTH OF JULY HOLIDAY</td>
<td>06-Jul</td>
<td>NO LAB – Compensation for Evening Exams</td>
<td></td>
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<tr>
<td></td>
<td>07-Jul</td>
<td>Acid-Base Equilibria</td>
<td>07-Jul</td>
<td>07-Jul</td>
<td></td>
<td></td>
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<tr>
<td>Week</td>
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<td>Lecture Topic</td>
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<td>Week</td>
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<tr>
<td>10-Jul</td>
<td>Acid-Base Equilibrium</td>
<td>16.5-16.6; pp 735-746</td>
<td>10-Jul</td>
<td>Acid-Base Equilibrium</td>
<td>16.7; pp 746-749</td>
<td>L6: Describing Acids (Ch 4)</td>
<td>5</td>
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<tr>
<td>17-Jul</td>
<td>Buffers</td>
<td>17.1; pp 780-782</td>
<td>17-Jul</td>
<td>Exam II</td>
<td>17-Jul</td>
<td>M; 07/17/17; 6:30 pm</td>
<td>WTHR 320</td>
</tr>
<tr>
<td>18-Jul</td>
<td>Buffers; Titrations</td>
<td>17.2; pp 775-790</td>
<td>18-Jul</td>
<td>pH and Buffers (HO4)</td>
<td>16.12; pp 763-765</td>
<td>L8:</td>
<td>6</td>
</tr>
<tr>
<td>20-Jul</td>
<td>Titrations; Lewis Acids/Bases</td>
<td>19.1; pp 878-881</td>
<td>20-Jul</td>
<td>Amount of Copper in a Penny (HO5)</td>
<td>19.2; pp 881-884</td>
<td>L9:</td>
<td>6</td>
</tr>
<tr>
<td>27-Jul</td>
<td>Oxidizing &amp; Reducing Agents</td>
<td>25.1-25.2; pp 1064-1071</td>
<td>27-Jul</td>
<td>Oxidation-Reduction Reactions; Oxidizing and Reducing Agents (Ch 5)</td>
<td>25.3-25.4; pp 1076-1082</td>
<td>L11:</td>
<td>7</td>
</tr>
<tr>
<td>31-Jul</td>
<td>Organic Chemistry</td>
<td>25.3-25.4; pp 1076-1082</td>
<td>31-Jul</td>
<td>---CHECK OUT---</td>
<td>25.6; pp 1098-1101</td>
<td>Proper lab dress and goggles are required.</td>
<td>8</td>
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<tr>
<td>01-Aug</td>
<td>Organic Chemistry</td>
<td>25.6; pp 1098-1101</td>
<td>01-Aug</td>
<td>---CHECK OUT---</td>
<td>---CHECK OUT---</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>02-Aug</td>
<td>FINAL EXAMS</td>
<td>---CHECK OUT---</td>
<td>02-Aug</td>
<td>---CHECK OUT---</td>
<td>---CHECK OUT---</td>
<td>8</td>
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</tr>
<tr>
<td>04-Aug</td>
<td>FINAL EXAMS</td>
<td>---CHECK OUT---</td>
<td>04-Aug</td>
<td>---CHECK OUT---</td>
<td>---CHECK OUT---</td>
<td>8</td>
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</table>