Inorganic Chemistry 2 (26:160:413)
Fall 2019, Rutgers University-Newark

Instructor: Prof. Demyan Prokopchuk, demyan.prokopchuk@rutgers.edu
Class Time and Place: Mon/Wed 4:00 PM – 5:20 PM, Smith Hall Rm 240 (SMT-240)
Office location and hours: Life Sciences Center, Rm. 200 (LSC200)
Office Hours: Thursdays and Fridays 1:00-2:00 PM
Prerequisites: 21:160:346 PHYSICAL CHEMISTRY II, 21:160:313 INORGANIC CHEMISTRY I

Using smartphones and other electronic gadgets during class is unacceptable.

Overview
This course will cover classical and modern aspects of coordination chemistry with transition metals and main group elements. Fundamental principles such as ligand coordination, binding mode, spin state, and steric/electronic contributions will be presented. The coordination of different ligand classes to transition metals will be presented, including reactivity trends. Particular emphasis will be placed on organometallic chemistry, small molecule activation, reaction mechanisms, and catalysis.

Required Textbooks

Additional Resources
2. Jean, Y. Molecular Orbitals of Transition Metal Complexes; Oxford University Press, 2005. (digital version available through Rutgers Library)

Grading and Evaluation

Quizzes: 20%
Midterm: 30%
Final Exam: 50%

Quizzes (20%)
Short quizzes (25-30 min.) will be held regularly during the class period (upcoming quiz will be announced ca. one week beforehand). The lowest quiz score will be dropped from your final grade and makeup quizzes will not be allowed. Doing the assigned practice problems will be very beneficial for quiz preparation.

Midterm (30%)
The midterm exam will be held during the regular class period. The exam will consist of questions that typically require a detailed written answer and/or some sketching (e.g., MO diagrams, metal
complexes, organic and inorganic compounds). **Makeup exams will not be allowed unless there is a legitimate written reason in accordance with University Policy.**

**Final (50%)**

The final exam will be held at the end of the semester and cover lecture material from the course (duration: 3 h). A periodic table and any relevant formulas will be provided on the exam handout.

### Class Schedule

<table>
<thead>
<tr>
<th>Date (approx.)</th>
<th>Chapters*</th>
<th>Topics Covered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sept 4, 9</td>
<td>19</td>
<td><em>d</em>-Block Chemistry: General Considerations</td>
</tr>
<tr>
<td>Sept 11, 16</td>
<td>2, 5</td>
<td>Bonding and MO Theory (Review)</td>
</tr>
<tr>
<td>Sept 18, 23, 25, 30; Oct 2, 7</td>
<td>20</td>
<td><em>d</em>-Block Chemistry: Coordination Complexes, Bonding and Reactivity</td>
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<tr>
<td>Oct 9, 14</td>
<td>26</td>
<td><em>d</em>-Block Chemistry: Reaction Mechanisms</td>
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<tr>
<td><strong>Oct 16</strong></td>
<td>midterm</td>
<td>Midterm Exam (in class)</td>
</tr>
<tr>
<td>Oct 21, 23, 28</td>
<td>8, 10</td>
<td>Redox chemistry (Review) and Hydrogen</td>
</tr>
<tr>
<td>Oct 28, 30</td>
<td>11, 12, 15, 23</td>
<td>Group 11, 12, 15 elements: selected topics s- and p-block Organometallics</td>
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<tr>
<td>Nov 4, 6, 11, 13,</td>
<td></td>
<td></td>
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<tr>
<td>Nov 18, 20, 25, 27 Dec 2, 4, 9, 11</td>
<td>24, 25</td>
<td><em>d</em>-block Organometallic Chemistry and Catalysis</td>
</tr>
<tr>
<td><strong>TBD</strong></td>
<td>Final</td>
<td>Time TBD, SMT-240</td>
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</tbody>
</table>

*Chapter numbers are the same for the 4th Edition.

### Important Dates

- Last day to drop without “W” Grade: **Sept. 10th, 2019**
- Last day to drop course and receive “W” Grade: **Nov. 4th, 2019**

### Attendance and Academic Integrity Policy

Please review the Rutgers University Attendance Policy: [https://policies.rutgers.edu/view-policies/academic—section-10](https://policies.rutgers.edu/view-policies/academic—section-10)

As per the University’s Course Attendance policy (10.2.7), students are responsible for communicating with their instructors regarding absences. As an academic community dedicated to the creation, dissemination, and application of knowledge, Rutgers University is committed to fostering an intellectual and ethical environment based on the principles of academic integrity. Academic integrity is essential to the success of the University’s educational and research missions, and violations of academic integrity constitute serious offenses against the entire academic community. The entire Academic Integrity Policy can be found at [http://academicintegrity.rutgers.edu/academic-integrity-policy](http://academicintegrity.rutgers.edu/academic-integrity-policy). This policy applies to all Schools and Colleges of Rutgers, the State University of New Jersey, including the Ernest Mario School of Pharmacy and the Rutgers College of Nursing.
Special Accommodations

- **Students with Disabilities:** Rutgers University welcomes students with disabilities into all of the University's educational programs. The Office of Disability Services (ODS) is responsible for the determination of appropriate accommodations for students who encounter barriers due to disability. In order to receive consideration for reasonable accommodations, a student with a disability must contact ODS, register, have an initial appointment, and provide documentation. Once a student has completed the ODS process (registration, initial appointment, and documentation submitted) and reasonable accommodations are determined to be necessary and appropriate, a Letter of Accommodation (LOA) will be provided to the student. The student must give the LOA to each course instructor, followed by a discussion with the instructor. This should be completed as early in the semester as possible as accommodations are not retroactive. More information can be found at [ods.rutgers.edu](http://ods.rutgers.edu). Contact ODS: (973) 353-5375 or ods@newark.rutgers.edu.

- **Religious Holiday Policy and Accommodations:** Students are advised to provide timely notification to instructors about necessary absences for religious observances and are responsible for making up the work or exams according to an agreed-upon schedule. The Division of Student Affairs is available to verify absences for religious observance, as needed: (973) 353-5063 or DeanofStudents@newark.rutgers.edu.

- **Counseling Services:** Counseling Center Room 101, Blumenthal Hall, (973) 353-5805 or [http://counseling.newark.rutgers.edu/](http://counseling.newark.rutgers.edu/).

- **Students with Temporary Conditions/Injuries:** Students experiencing a temporary condition or injury that is adversely affecting their ability to fully participate in their courses should submit a request for assistance at: [https://temporaryconditions.rutgers.edu](https://temporaryconditions.rutgers.edu).

- **Students Who are Pregnant:** The Office of Title IX and ADA Compliance is available to assist students with any concerns or potential accommodations related to pregnancy: (973) 353-1906 or TitleIX@newark.rutgers.edu.

**Gender or Sex-Based Discrimination or Harassment:** Students experiencing any form of gender or sex-based discrimination or harassment, including sexual assault, sexual harassment, relationship violence, or stalking, should know that help and support are available. To report an incident, contact the Office of Title IX and ADA Compliance: (973) 353-1906 or TitleIX@newark.rutgers.edu. To submit an incident report: tinyurl.com/RUNReportingForm. To speak with a staff member who is confidential and does NOT have a reporting responsibility, contact the Office for Violence Prevention and Victim Assistance: (973) 353-1918 or run.vpva@rutgers.edu.