1. **Course Name:**
BMI 591: Clinical Application Development

2. **Time/Location:**
Wednesdays 10:30-13:30. Tempe

3. **Instructor:**
Davide Sottara, PhD – davide.sottara@asu.edu.
Office Hours: by appointment
Robert A. Greenes, MD, PhD – greenes@asu.edu
Office Hourse : TBA

5. **Designation:** Elective

6. **Catalog Description**
This practical, project-oriented course will focus on the development of applications for patients and healthcare providers. Students will work in teams on selected projects. The applications will be based on scalable architectures and web-oriented user interfaces, compatible with both traditional and mobile devices. Emphasis will be given to clinical decision support applications although other project ideas can also be considered. Model-driven, service oriented and event-driven architectures will be evaluated. Information models for clinical data delivery and interchange will be discussed. Common services will be presented, including authentication, security, terminology, reasoning, analytics and task management. For each component, the state-of-the-art standards and mainstream open-source implementations will be adopted. The lectures will cover both the theoretical and the implementation aspects, with the time equally divided between the two.

7. **Prerequisites**
None

8. **Textbook And/Or Other Material**
Teaching material provided by the instructors, online resources

9. Software Tools
See lecture detail

10. Course Objectives
- Describe the internal architecture of a robust, scalable applications
- Describe the domain-specific requirements of a clinical application
- Appreciate the difference between self-contained and distributed applications
- Develop a (mobile) application collaboratively
- Evaluate and implement existing standards
- Leverage preexisting capabilities exposed as services
- At least 3 of the following:
  - Understand the role of Clinical Terminologies
  - Understand the role of Business Process / Workflow models for (Service) Orchestration
  - Understand the role of Security :
    Authentication, Encryption and Controlled Data Acesss
  - Understand the role of Business Rules

- Understand the role of Ontologies
- Understand the role of Predictive Models

11. Course Outcomes

- To be able to design, implement, test and ultimately deliver a complex clinical application
- To be an effective member of a collaborative development team
- To be familiar with standards for interoperability
- To be able to integrate existing components and services
- To develop secure applications managing sensitive data
- To integrate domain-specific knowledge into an application using a model-driven approach

12. Course Topics

See lecture detail. The program is available on BlackBoard, or by request from the instructor

13. Class Schedule

50% frontal lecture, 50% hands-on activities

14. Grading policies

- In-class labs and assignments 35%
- Final project 55%
- Class participation 10%